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COMPUTERWORLD

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New CPUs replace IBM 3080 series

By Tom Henkoff
CW Staff

RYE BROOK, N.Y. — IBM last week replaced its 3080 line of mainframes with six new CPUs that incorporate design and circuit-packaging enhancements said to increase internal performance 5% to 14% over current models. The new models are being offered at the same price as the older systems, but current users cannot field-upgrade to the new machines.

The new mainframes — the 3083 Models EX, BX and JX, the 3081 Models GX and KX and the 3084 Model QX — are direct replacements for the 3083 Model E, Model B and Model J, the 3081 Models G and K and the 3084 Model Q, respectively, which have been taken out of new production. Shipments of the X models will begin immediately; users with 3080 series systems on order will automatically receive the new models, IBM said.

Aside from the performance enhancements to the CPUs, the X model systems offer virtually the same memory and channel characteristics as the older 3080 series machines, an IBM spokesman said. The exceptions are the 3081 Model KX, on which the maximum main memory was expanded from 48M to 64M bytes, and the 3084 Model QX, whose maximum main memory jumped from 64M to 128M bytes.

According to IBM, the X models incorporate improved circuit packaging, which has resulted in a consolidation of some internal components. The consolidation allows the elimination of one Thermal Conduction Module. It is this consolidation of internal components that makes it impossible for current users of 3080 series machines to field-upgrade to the X models, the spokesman explained.

The X models of the 3083 line reportedly deliver 5% to 8% greater internal throughput than the older models when used in IBM MVS/XA, MVS/370 or VM/SP High-Performance Option operating environments.

The 3081 X models offer 8% to 10% greater internal performance under MVS/XA and MVS/370 and up to 14% greater throughput when operating under VM/SP HPO. The 3084 Model QX offers 8% greater throughput running under MVS/XA, IBM said.

Maintenance fees cut

At the same time that it introduced the X processor models, IBM cut the monthly maintenance fee on old versions of the 3080 series by up to 15% to equal the monthly maintenance fees on the X models. It also announced 7% to 10% price reductions on processor upgrades for users of the older 3080 system configurations. Both changes are effective immediately.

As examples of the lower monthly maintenance fees on older 3080 series processors, IBM said the former $5,150 monthly maintenance fee for a 3081 Model G system with 32M bytes of main memory has been cut to $4,475. A 3081 Model K with 48M bytes of main memory now carries a monthly maintenance fee of $5,005 instead of $6,435.

As examples of the price reductions on model-to-model upgrade charges on older

See IBM page 8

TOP OF THE NEWS

Elbowing its way into the crowded IBM-compatible microcomputer marketplace, Zenith Data Systems Corp. last week announced two machines. Page 2. Earlier, IBM had announced its Portable Personal Computer (Page 63), but Compaq Computer Corp. isn't too worried about it (Page 98).

■

The list of lawsuits against Burroughs Corp. grew even longer as a nursing home management firm, a B920 user, filed a $1 million suit. Page 2.

■

In a hard-hitting keynote address at the Office Automation Conference last week, the president and chief executive officer of Xerox Corp. said there is neither a clear mission nor a clear sense of urgency in automating office functions. Page 11.

■

Health-related problems are widespread among VDT operators, a survey by 9 to 5 found. Page 12. Meanwhile, opposition to the regulation of VDT use is growing. Page 12.

■

The Federal Communications Commission said no to the charges for accessing long-distance, private-line and dial-up services that were proposed by most of the nation's local telephone companies last October. Page 15.

■

Groundwork for a national consortium to meet telecommunications needs was laid last week. Page 62.

■

Security getting lip service only

By John Gallant
CW Staff

PARK RIDGE, Ill. — Upper level management is aware of the importance of data security, a recent survey indicated, but that awareness does not always translate into money and support for DP managers who must provide the security.

In a survey conducted by the Data Processing Management Association, 70% of the 200 DPMA members responding said they believe upper management in their organizations is "aware of the importance of data security." But only 65% of those companies allocate a portion of their annual budgets to data security programs.

The survey found that among the firms that provide such funding, only 2.7% of the corporate budget is slated for data security purposes. Also, fewer than half the DPMA members within those organizations said their data security budgets are scheduled for increases in the upcoming year.

The budget findings were highlighted by the fact that DPMA members said their companies would lose an average of more than $142,000 per day in the event of a systems failure brought on by a computer break-in or some other security breach. Further, 32% of the DP and MIS professionals responding said they want to win "solid commitment and support" from upper level management in addressing security issues.

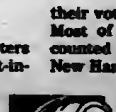
See SECURITY page 6

FYI

Tomorrow's primary may go slowly

By James Connolly
CW Staff

CONCORD, N.H. — New Hampshire voters will participate tomorrow in their first-in-the-nation presidential primary, becoming, as they have for three decades, the first Americans to vote for candidates who have wooed them for a year.



CAMPAIGN '84

Technologies such as computers and television have brought states scientifically tailored candidates, continuous polling and instant declarations of winners — as Iowa discovered when TV network news anchors awarded Walter Mondale a win before the Democratic caucuses were fully under way last week.

But most of the Granite State's 451,000 voters will not see evidence of those technologies at the two crucial times: when they cast their votes and when they count their votes. Most of the state still relies on manually counted paper ballots. Only seven of the 259 New Hampshire cities, towns and unincorporated communities use either mechanical voting machines or punched-card computer voting, according to Deputy Secretary of State Robert Ambrose. When polls close at 8 p.m. EST tomorrow, the networks are likely to project a winner within an hour, based on key precincts and past voter trends.

But the official vote count will take about two days, as town officials tabulate paper ballots and hand the ballots to state troopers for transport to the state capitol here.

"We have a Wang [Laboratories, Inc.] VS80

See VOTE page 12

Zenith offers IBM compatibles

By David Myers
CW New York Bureau

NEW YORK — Zenith Data Systems Corp. last week elbowed its way into the crowded bazaar for IBM-compatible personal computers with the announcement here of two machines, a desktop unit and a portable.

In all, the Glenview, Ill.-based subsidiary of Zenith Radio Corp. announced five configurations — three desktop systems and two portables. Based on Intel Corp.'s 8088 microprocessors, all five are essentially the same, offering from 128K to 640K bytes of random-access memory; two RS-232C serial ports; one Centronics Data Computer Corp.-compatible parallel port; red, green and blue color output; an IBM expansion bus; and a detached keyboard. The models differ in the number and type of disk drives used.

The desktop unit, the Z-150, is available with single or dual, 5¼-in., soft-sector floppy disk drives. It is also available in a dual-drive configuration employing one floppy and one 10.6M-byte Winchester disk drive.

Available in volume

The Z-150 has a base price of $2,600, which is $430 more than IBM's 128K-byte Personal Computer. Zenith said at the time of its introduction last week that the Z-150 is available in volume.

The portable unit, the Z-160, comes with either single or dual floppy disk drives. Weighing 30 lb, it incorporates a built-in, 9-in., brown-tone monitor and retails for $2,799, $4 more than the recently announced IBM Portable Personal Computer (see story page 83) and about $200 less than a rival machine from Compaq Computer Corp., the Houston-based leader of the portable sweepstakes.

The Zenith portable is scheduled to appear May 1, two months after initial shipments of the IBM Portable Personal Computer. A Winchester version is slated for the future.

"We agree with those who say that by the end of the decade, 74% of the [personal] computers in business offices will be IBM or IBM-compatible machines," Donald P. Moffet, president of Zenith Data Systems, told the press conference here last week at which the Zenith micros were unveiled.

The new computers join two Digital Research, Inc. CP/M-based systems in Zenith's product line. Both desktop and portable are equipped with a detachable keyboard manufactured for Zenith by Alps Electric, a Tokyo-based components maker.

IBM compatibility

John Frank, Zenith's vice-president of marketing, said the two new computers will run virtually any software program developed for the IBM Personal Computer and accept virtually any plug-in expansion board for the Big Blue machine.

Zenith marketers claimed the company has tested 175 programs and dozens of plug-in boards. The company promised to publish a bimonthly list of successfully tested IBM-compatible software products.

The Zenith personal computers will support Basic, assembler, Fortran and Pascal, as well as Microsoft, Inc.'s Word and Multi-Plan 1.1 and Lotus Development Corp.'s Lotus 1-2-3 financial spreadsheet, according to company spokesmen. In July, Microsoft's Windows and the Lotus Symphony products will also be available on the Zenith machines.

Tom Dornback, vice-president of software development for Zenith, said the new computers run under a "standard implementation" of Microsoft's MS-DOS 2.0 operating system. Most makers of IBM-compatible equipment opt for an operating system modeled upon PC-DOS, the altered version of MS-DOS developed by IBM for its machines. By contrast, the Zenith systems' compatibility resides in a proprietary I/O statement lodged in read-only memory code, according to Dornback.

Vulnerable to change?

A consultant here who asked not to be named said that chip-level compatibility was "easier for [Zenith]. They didn't have to meddle with the software. But it leaves them vulnerable to changes in the IBM architecture. If IBM ever decides to change its chips, Zenith will be in the position of having to copy [those changes] to remain compatible."

With IBM now quoting a delivery time of four months on large-volume orders of its Personal Computer, the initial success of the Zenith boxes appears to depend on the company's ability to keep its delivery schedule ahead of Big Blue's. But as IBM's lead times shrink, Zenith will have to sell its personal computers on less dependable factors, such as ease of use, a consultant here told *Computerworld*.

Zenith Data Systems is located at 1000 Milwaukee Ave., Glenview, Ill. 60025.

B920 user sues Burroughs for $1 million

By Patricia Keefe
CW Staff

BLOOMINGTON, Ill. — Burroughs Corp. is the target of a $1 million lawsuit brought this month by the user of a B920 turnkey system.

Filed in U.S. District Court in Springfield, Ill., by Care Management, Inc. (CMI), a nursing home management firm, the suit alleges that Burroughs' sales personnel "engaged in deception, fraud, false promises and misrepresentations" and that the vendor was aware that other buyers had experienced problems with the B920 system. CMI's attorney, Gerri Papushkewych, declined to identify the other buyers.

Bevy of lawsuits

It has been estimated that at least 150 lawsuits have been filed against Burroughs over the last three or four years, typically charging the vendor with fraud or misrepresentation or breach of contract or some combination of the three. Marvin Benn, an attorney for Chicago law firm Hamman, Benn and Miller, handling over 60 of these cases, said his firm has not "lost" a case to date, settling all "to the mutual satisfaction of the parties involved." Hamman, Benn and Miller has represented users of Burroughs' B700, B80, B800, B1700 and B1800 machines.

The suit filed by CMI accuses Burroughs of having caused that user to suffer "severe financial losses" after it bought the B920 which, it claimed, never operated as promised. The financial losses include damage to business services and reputation and loss of internal control of cost and customers, according to Papushkewych.

CMI paid $100,000 for the system in December 1980. The suit alleges the system could not perform functions the company needed, in particular, multicompany processing; was not completely compatible with CMI's Burroughs B700 minicomputer; and was not fully operable by the end of August 1981 as promised. When the hardware was installed, Papushkewych said, the software "was not there."

The B920 "is alleged to be deceptive in that significant parts of the computer system were not operable and could not be made operable," she said. Also, "some components of the system do not work together."

Attempts to reach a Burroughs spokesman for comment were unsuccessful.

However, John Felzan, an attorney for the Chicago-based law firm of Kirkland and Ellis, which has represented the vendor in the past, said he is unaware of any other suits involving the B900 series. Stressing that he has not seen the complaint and does not know whether his firm will be retained in this case, Felzan said, "It is my understanding that the general industry perception and studies of the B900 series have been and are quite favorable."

CORRECTIONS

The announcement of the Fiber Optic Net/One local-area network [CW, Feb. 6] incorrectly referred to Siecor Fiberlan as a fiber-optic transmission subsystem. Siecor Fiberlan is a division of Siecor Corp. It sells the Net 10 transmission subsystem to Ungermann-Bass, Inc. under an OEM agreement. When Net 10 is combined with Ungermann-Bass equipment and software, the result is Fiber Optic Net/One.

"High-tech Robin Hood pays piper" [CW, Feb. 6] incorrectly stated that Washington state's Cedar Creek Corrections Center is in Little Rock, Ark. It is actually located near Littlerock, Wash.

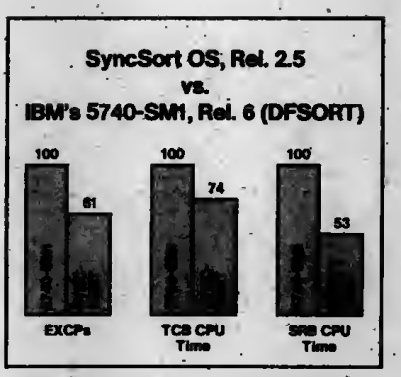
NEWS SUMMARY

ENCOUNTER

How new SyncSort outperformed IBM's Release 6 by 36% in their very first meeting!

Call (201) 568-9700.

Try our hot new OS Sort.



Ironically, some of SyncSort's most glowing recommendations come from the mouths of IBM systems engineers. Here's the latest example.

One of our systems engineers recently visited the computer center of a well-known worldwide manufacturer. His mission was to install and demonstrate SyncSort 2.5, the latest and most advanced release of our OS sort program.

As our man sat down at the console, an IBM "MVS Specialist" joined the group. "Can I help with the installation?" he asked. Of course, Our Man replied, thanks for the offer.

After SyncSort 2.5 had been installed, the IBMer came up with another helpful suggestion. "Would you mind if we benchmarked your sort against our 5740-SM1, Release 6? I just happen to have a copy here."

Not in the least, Our Man replied. It was the first duel between SyncSort 2.5 and Release 6 (also known as DFSORT). But our systems engineer was confident that 2.5 could outperform Release 6 anywhere, anytime.

The benchmark was run, and the results bore out Our Man's confidence. SyncSort 2.5 had outperformed Release 6 by a wide margin.

The IBMer was clearly disappointed. But he wasn't ready to concede yet. "Let's take a look at the results on the monitor I've installed," he said.

He explained that the monitor had an "awesome capability" for measuring total resource consumption. It produced an overall "resource utilization" index that reflected the aggregate impact of such vital items as SRB CPU Time, TCB CPU Time, and EXCPs.

Suppressing a grin, Our Man agreed. And this time the IBMer shot himself in the foot with his own monitor.

SyncSort 2.5 had outperformed Release 6 by a whopping 36%—as the charts below indicate:

Resource Utilization Index

How did the IBMer react? Like a gentleman and a scientist. "Well," he said affably, "I've always known a lot of specialized software houses can produce better products than we can in certain areas. Obviously, you've got the best sort."

Then he deleted his sort program from the system and went on to other duties.

Who said chivalry is dead?

syncsort INC.

Syncsort Incorporated 560 Sylvan Ave., Englewood Cliffs, N.J. 07632

Behind the looking glass, users test IBM software

By John Gallant
CW Staff

ATLANTA — A young woman sits working at a computer terminal in a smartly furnished office. Though she is alone, she is speaking aloud.

In the next room, a middle-aged businessman also talks to himself as he operates a microcomputer on his desk. Similarly, workers in adjacent offices chatter away to no one in particular while they tap the keyboards of other terminals or micros.

Has office automation come to Bedlam? Hardly. The talkative workers are actually product evaluators in a high-technology IBM software "usability laboratory" where their facial expressions, body movements and keystrokes are recorded on videotape along with the continuous stream of their comments.

Monitoring responses

In addition to the cameras mounted throughout the four simulated offices — or testing modules, as they are called here — panes of one-way glass allow designers and usability experts to monitor the responses of the test subjects as they attempt to use newly developed software products.

The evaluators are selected according to their ages, backgrounds and experience levels from temporary employment agencies in the city.

They are placed alone in the modules to read the product manuals and operate the software on the equipment for which it was designed — anything from the IBM Personal Computer to a mainframe terminal. Their physical responses and verbal feedback help designers pinpoint and resolve usability problems before a software package ever hits the marketplace.

The Atlanta Usability Lab is the first of three such evaluation centers developed by IBM since 1980, according to Mike Mehal, manager of product usability for IBM's Information Programming Services Group. IBM also maintains similar, though less sophisticated, usability labs in Dallas and Poughkeepsie, N.Y. Research here focuses primarily on application packages, while the other labs deal with system software.

Developed for usability

The idea for the labs grew from concepts developed at IBM's hardware-oriented human factors research centers across the country. "We recognized that the software environment is changing," according to Mehal.

"There is more emphasis today on the end user and the ease of use of each product. These centers were developed as an approach to making our software easier to use, building in usability, so to speak."

The usability labs were designed to make software developers aware of problems that would otherwise surface only when the package was used in a production environment. Mehal's staff of usability specialists aids developers in preparing and implementing the test situations and in collecting and analyzing the evaluation results.

The usability lab is laid out in a semicircle that permits developers and test experts to monitor all evaluators simultaneously. In the first phase of testing, subjects are encouraged to "think out loud" so their comments can be recorded and analyzed.

CW illustration by H. Feng

Second phase

In a second phase, a usability expert plays the role of the evaluator's supervisor whom the evaluator is prompted to telephone when he encounters difficulties with the package that he can't resolve on his own.

Each of the test modules is equipped as a working office environment complete with plants, paintings, desks and telephones. When the tests involve minicomputer or mainframe software, the processing equipment is located outside the module.

Videotape cameras are situated so that developers behind the glass can mix images of the evaluator, the keyboard and the terminal screen.

Common information base

The audiovisual test results and written evaluations are later made available to other development teams to promote what Mehal termed a "common base of usability information."

Mehal would not say whether all new IBM software is required to undergo usability evaluation, but he did point out that testing on one application may produce results that apply to a variety of other packages. In addition to testing a fully coded package and its documentation, evaluators are often asked simply to choose between several different screens or menus that a designer hopes to use in a future system.

The goal, according to Mehal, is to capture problems early, before any major coding changes are necessary. But that task isn't always easy. "If you fix one problem, chances are that three smaller ones will arise. If you go beyond those, you encounter five or six others," he said. "We have to determine just how far to keep fixing. You reach a point where the usability of a product adversely affects its performance. It's a real trade-off."

What it takes to become an IBM software evaluator

Some people are just too competitive to be good candidates for software evaluation.

"We sometimes have to coach the evaluators. We really have to work to convince some people that it's not a test of their knowledge or their computer literacy," said Mike Mehal, manager of product usability at IBM's Atlanta software evaluation laboratory.

Experts at the Atlanta usability lab try to overcome individual personality problems among evaluators by testing each package with as many as 16 subjects. Shorter tests, involving, for example, screen or menu preference, are conducted with as many as 25 evaluators.

Different age groups

Evaluators are employed for software product tests that can last as little as an hour or as long as two weeks. The evaluators are selected from different age groups and on the basis of their education, employment background and computer experience.

To evaluate a financial application properly, Mehal explained, subjects from 20 to 60 years of age with accounting backgrounds would be selected. Their collective computer literacy would vary, depending on the sophistication of the software to be tested.

The evaluators are given the product manuals and some test data and are asked to input the data on their own. During the evaluation, a usability specialist will often interrupt the evaluator with telephone calls to simulate actual work conditions and to analyze how easily a user can resume working with a package after his attention has been diverted.

Checking reactions

On occasion, usability experts will assemble users of existing IBM software to gauge their reactions to new products for the same application. All the subjects are outsiders, with the exception of IBM employees who, Mehal said, undergo "dry runs" to aid designers in developing test situations and data.

While most evaluators enjoy themselves during the testing, Mehal said, some find the process emotionally demanding as they attempt to solve problems they are only supposed to discover.

"We try to make them realize that they are helping us. We're not testing them. If there is something wrong with the software, that's our problem, not theirs. They may not all enjoy it, but they usually give 110%; they're great."

Software developers can also find the evaluation process trying as users candidly highlight flaws and inconsistencies in their creations. Like writers, Mehal pointed out, the developers have an emotional stake in their products, and criticism is not always easy to swallow.

"In the beginning, we encountered some resistance on the part of the developers," according to Mehal.

"Some of them are afraid of the exposure when problems come to light. But that hesitancy is waning over time as the developers become more open to the concept of usability."

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Micro-mainframe links debut in New Orleans

By Paul Gillin
CW Staff

NEW ORLEANS — Amid dozens of enhancements, marketing agreements and ports to other hardware announced at the Softcon International Conference and Trade Fair for the Software Industry here last week were two products of particular interest to DP installations looking to tie their microcomputers to mainframes.

CW AT OAC '84

Artificial Intelligence Corp. (AIC) announced the Intellect Micro-to-Mainframe Link, based on its Intellect English-language query product. The package allows IBM Personal Computer users to access, retrieve and display information resident on their IBM mainframes in conversational English. In addition, Intellect now acts as a front-end supervisor to a variety of popular IBM Personal Computer-based software packages.

The link offers access to mainframe data stored in Intellect-supported data base management systems, including IBM's SQL/DS and Vsam files; Cullinet Software, Inc.'s IDMS; Software AG of North America, Inc.'s Adabas; and AIC's Dfam access method and sequential files. Intellect manages data selection, analysis, output and transfer into the micro software.

Expandable dictionary

The product also includes an expandable lexicon dictionary, micro graphics capability, terminal emulation to the IBM host via IBM's VM/CMS or TSO and "visible" support of multitasking through windows and security.

The software requires Intellect under VM/CMS or TSO, the mainframe-to-micro software option and an asynchronous RS-232 connection or coaxial connection to an IBM 3274 controller. The IBM Personal Computer must be equipped with 256K bytes of random-access memory, Digital Research, Inc.'s Concurrent CP/M 86 or IBM's PC-DOS. The link also requires AIC's micro-to-mainframe software option and specific micro software.

Deliveries are scheduled for the third quarter. The host software costs $17,500, including the mainframe communications module and software packages to link 10 Personal Computers to the mainframe. Additional micro packages are priced at $250 per copy.

AIC is located at 100 Fifth Ave., Waltham, Mass. 02254.

CAP Gemini introduction

CAP Gemini Software Products, Inc. announced a product that allows enhanced IBM Personal Computer XTs to be used as dedicated programmer workstations in an IBM VM/CMS or TSO environment. The Multipro Application Development Workstation includes facilities to download mainframe programs to the workstation and provides a variety of tools that automate systems design and programming.

Flow charts, user documentation, design specifications and record layouts are all stored in libraries along with the source code, a spokesman noted. A windowing function allows different components of the application project to be displayed simultaneously and offers data transfer between the windows. Windowing allows the user to execute a CMS job on the mainframe, move to another window to perform local editing and return to CMS to retrieve the results of the job execution.

An editing facility similar to IBM's Structured Programming Facility is provided along with a project library containing interfaces to popular library systems. Also included is a document generating facility, calculator functions and a project management facility.

The product uses a proprietary graphics system to produce graphics symbols that can be stored as ordinary text. Graphics can be interspersed with text to create flowcharts and design documents which reside in the Multipro library.

Emulation capability

Multipro can let the Personal Computer XT emulate an IBM 3270 or Digital Equipment Corp. VT100 terminal in one of the windows and transfer data between the windows. It is also possible to process mainframe-resident files from the workstation without downloading using a buffer.

The capability restricts access to mainframe programs that data processing does not want loaded onto floppy disks.

The mainframe package is priced at $24,000, and the software for each workstation costs $1,900. The Personal Computer XT also requires a standard communications interface to the mainframe, which costs about $1,000.

CAP Gemini is headquartered at 2350 Valley View Lane, Dallas, Texas 75234.

Turnout low, but show seen worth the effort

By John Gallant and Paul Gillin
CW Staff

NEW ORLEANS — Whether last week's Softcon International Conference and Trade Fair for the Software Industry lived up to expectations depends on how lofty your expectations were. While the show apparently succeeded in getting vendors in touch with a sophisticated audience, the turnout was relatively low. And the notable absence of a large-user audience indicated that the question of whether the software industry can support an end-user trade show is still unresolved.

CW AT SOFTCON

That was the consensus of nearly 20 vendors and attendees interviewed here last week by *Computerworld*. In contrast to what some vendors expected, the Softcon audience was composed almost entirely of dealers and software developers. While this was a sore point with some attendees, most agreed that Softcon had been worth the effort and could develop into a major trade show.

Throughout the interviews, comparisons of Softcon to last year's mammoth Computer Dealers Exposition (Comdex) show were unavoidable. Most vendors agreed that the atmosphere was more productive.

"The crowds are quieter and less frazzled," said Michael Mango, national marketing manager for Accountants Micro Systems, Inc. "The traffic flow is a little lighter than I would have expected, but the type of people who come here are serious buyers."

However, those buyers generally did not include representatives from large corporations. While most vendors shrugged off the absence of Fortune 1,000 accounts, others felt the show's voluminous promotional campaign had been misleading. "We decided to come here at the last minute because we didn't want another Comdex," said Sol Chooljian, vice-president of marketing at Context Management Systems of Torrance, Calif. "We wanted more to deal with the volume buyers from corporations. I haven't seen any of those people."

Although attendees from large corporations were hard to come by, one DP professional called the show "terrific, especially compared to Comdex. In three days at Comdex, I couldn't see it all," said Jack Sprague, a senior systems engineer at Frito-Lay, Inc. in Dallas. "I came here to evaluate Lotus [Development Corp.] and to see a lot of their competitors. It's been a good show."

Attendance totaled over 19,000 after two days, but that figure included exhibitors. Most vendors indicated that totals fell short of their expectations. "It's kind of disappointing once you get used to the chaos of the Consumer Electronics Show," said Jeff Schwamberger, manager of product acquisitions for the Brisbane, Calif.-based Human Engineered Software, Inc. "I'm not saying I'm disappointed in the quality of the people attending, but there is a lot of dead air in here. We're doing a lot of sitting around and waiting between customers."

"It's not as large as I expected," agreed Edward Behn, vice-president of Gregg Corp. in Waltham, Mass.

"Attendance could be better, a lot better," Tim Fuller of Atlanta-based Peachtree Software, Inc. said.

However, Fuller and others added that they were generally impressed with the sophistication of the visitors. "I'm impressed with the quality of the people who have stopped to see us," said Michael Pearce, vice-president of sales for Accountants Micro Systems, Inc. of Bellevue, Wash. "There aren't as many people here as we'd like to see, but they are informed. All in all, it's not bad for a first attempt."

Attendees were divided on the issue of whether Softcon proved that the software industry is capable of supporting its own trade show. Mango pointed out that some of the largest exhibits were still hosted by vendors like IBM, Digital Equipment Corp. and NCR Corp. "It's billed as software only, but if you look around, you see a lot of hardware vendors," he said.

Others pointed out that Softcon had apparently failed to attract a national audience. "We're seeing mostly local dealers and absolutely none from the West Coast," said Phillip Kessler, president of Carlsbad, Calif.-based Allenbach Industries, Inc. "I think that's a real weakness with this show. Perhaps in the future they may want to have smaller, regional shows."

He was seeking software that could take a beating

By Paul Gillin
CW Staff

NEW ORLEANS — Capt. Jim Caudle came to the Softcon International Conference and Trade Fair for the Software Industry here last week looking for software that was fast, dependable and able to take a beating. That last quality is especially important in Caudle's line of work. He was one of two technicians sent to Grenada on short notice to install a network to automate the command and control procedures used on the island during the U.S. invasion last October.

CW AT SOFTCON

Caudle is an automatic data processing systems officer in the 18th Airborne Corps of the U.S. Army at Fort Bragg, N.C. When he is not parachuting out of airplanes, he is responsible for designing and implementing micro-based systems in the controller's office at Fort Bragg.

The call to fly to Grenada came just two days after U.S. troops stormed the island on Oct. 25. Within a week, Caudle and another technician packed Fort Bragg's Apple Computer, Inc. Apple II+-based system into ruggedized containers, obtained and customized a backup system based on Grid Systems, Inc. portable computers, trained the operations staff and transported and installed the computers and communications gear on the occupied island.

The system was designed by Caudle to track supplies and send messages electronically using a modem and satellite telecommunications. It also performs battlefield analysis using a graphics system that superimposes symbols over images generated by an optical disk.

The system is based on a local-area network comprised of two Apple II+ micros with two terminals, a 20Mbyte Corvus Systems, Inc. optical disk and an Apple printer. While Caudle would not specify the communications gear used, he said the data is encrypted during transmission via satellite.

He arrived with the system while sporadic fighting was still going on in Grenada. "There was a lot of destruction and some sniper fire still going on when I got off the transport plane," he said.

The systems were transferred from the airport to a hotel annexed by the Army as temporary headquarters and installed within hours. The installers confronted some problems in reconfiguring the hotel's power supply to run the Apple system and in training the command personnel to use the software. As a result, they worked 12- to 16-hour shifts for most of the 33 days they were on the island.

Caudle said the process of implementing a command system during a battle was particularly exciting. "At least it was doing something that was critical under pressure," he said.

Fortunately, the equipment performed flawlessly. "We didn't even need the backup systems," he noted. The result was a dramatic improvement in communications between military command on the island and Fort Bragg. "Some of the critical information would have taken hours instead of minutes to communicate," he said. "Normally they would use a Teletype terminal and paper tape and transmit at 110 bit/sec. We were able to operate at 1,200 bit/sec."

Info centers gaining

PARK RIDGE, Ill. — Nearly 60% of the Data Processing Management Association (DPMA) members that responded to a recent survey said their companies will have information centers by year-end.

More than 40% of the 200 DPMA members answering the survey said their companies already have information centers; another 19% said their firms will have one in place by the end of 1984.

In addition, according to Austin Weber, assistant publications editor for the DPMA, nearly 80% of the membership responded that upper management in their companies is aware of the information center concept. "The survey shows the growing importance of the information center," Weber said. "They are really beginning to take hold in the corporate world."

The DPMA members split almost down the middle on the question of which department should be responsible for the design and implementation of the information center. Forty-eight percent said the tasks should fall to the data processing and end-user departments, while a slightly higher number — 49% — said those groups should work in conjunction with top management and outside consultants.

A majority of the DP managers surveyed said they wanted upper level management to exhibit support for the information center concept by providing necessary funding and personnel allocations. But a third of the respondents cautioned management to remember that the information center is only another information resource, not a replacement for traditional application development.

The DPMA survey did not include information on the size of the information center budgets or staff.

SECURITY from page 1

"I think it points out quite clearly to top-level people that the data processing manager is very concerned with the issue of security. The DP professional wants to maintain security, but he needs management support in budgeting for security and developing a security policy," Austin Weber, assistant publications editor for the DPMA, said.

When asked what suggestions they would offer to upper management on the issue of data security, the DPMA members' most common responses were:

- Do not overreact to everything you read, but avoid taking computer security for granted.
- Become more aware of the costs involved in data security and budget accordingly.
- Urge computer security as a major goal throughout the project development cycle.
- Take the positive attitude that security is everyone's business.
- Continue to take an active role in the organization's data security on a regular basis.

The leading threat to data security, according to members, is misuse of data by their own DP or MIS staffs, including programmers and systems analysts. Clerical users, outside intruders and management users were also seen as potential threats.

The survey findings are available from the DPMA's newsletter "Compufax," DPMA, 505 Bussey Highway, Park Ridge, Ill. 60068.

Fund forms to combat piracy

By John Gallant
CW Staff

NEW ORLEANS — Calling it a first shot in the war against piracy, the founders of the fledgling Software Protection Fund (SPF) began a quest for membership and funding among the microcomputer software publishers attending the Softcon International Conference and Trade Fair for the Software Industry here last week.

Organized in November by high-level executives from four leading micro software companies, SPF is intended to be a nonprofit, industry-wide organization geared to frustrating illegal copying of microprocessor software. Its initial members — Ashton-Tate, Lotus Development Corp., Sorcim Corp. and Microsoft, Inc. — formally unveiled SPF at a press conference here and began seeking funding for the group's $500,000 first-year budget.

SPF has initially targeted corporate rather than individual abusers of software copyright laws and license agreements, according to David Cole, Ashton-Tate's president and chief executive officer. Cole, who was appointed chairman of the SPF steering committee, said the group will attack these violators on four fronts: increased technical protection of software, attempts to initiate governmental protection, education of users and visible enforcement of license agreements.

"Elegant execution of just one or two of these areas won't produce the results we all desire in this industry," Cole said. "We must have a long-term effort on all four fronts. Only in that way can we protect our creative work."

SPF will work in conjunction with the Microcomputer Software Association (MCSA) arm of the Association of Data Processing Service Organizations, Inc. SPF will be responsible for coordinating the educational and enforcement efforts, while MCSA will focus on the remaining fronts.

SPF plans a joint advertising and direct-mail campaign for the spring and has earmarked at least half the proposed budget for those efforts. On the enforcement front, Cole said the group will promote the investigation of corporate abuse and will urge members to make clear their intent to prosecute abusers. The enforcement effort may also include the filing of joint *amicus curiae* briefs in support of SPF member companies involved in litigation.

"In an industry composed of stubborn entrepreneurs, this collective action is absolutely necessary," according to Lotus Development President Mitchell Kapor. "It will create a climate of opinion that will help resolve the piracy problem."

Cole said the group will present preliminary advertising proposals at its next meeting, the date of which has yet to be announced. SPF's founders also laid out the group's membership fee scale, which ranges from $5,000 to $50,000, depending on the annual net revenues of the member company.

La. unwraps bill to enforce copyrights

By John Gallant
CW Staff

NEW ORLEANS — State officials last week introduced legislation that they said would "strengthen significantly" the ability of software publishers to enforce their rights under existing trade-secret and copyright laws.

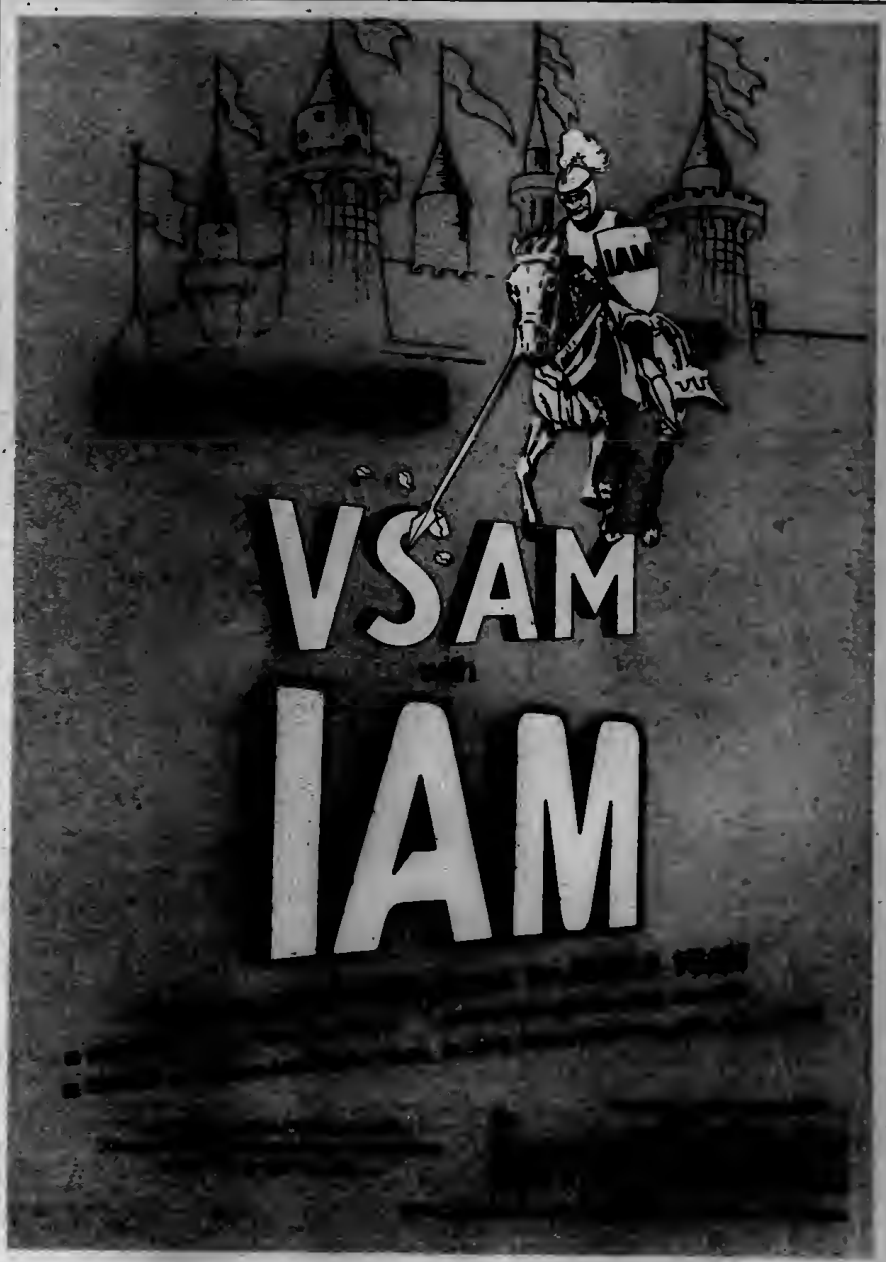
Taking advantage of a formidable media presence at the Softcon International Conference and Trade Fair for the Software Industry, the state attorney general's office unveiled the Software License Enforcement Act, which will be introduced into the Louisiana Senate and House of Representatives in April.

Described as the first of its kind in the nation, the proposed legislation would make it clear to consumers that license agreements appearing on software packaging will be enforced by the state. In the past, according to Louisiana Assistant Secretary of State J. Robert Wooley, state and federal courts have split on the issue of whether the packaged license statements constitute a binding contractual agreement with purchasers.

The bill, which deals primarily with microcomputer software, states that a consumer will be bound by the specific terms of the license agreement if the software package is opened or used. According to Wooley, the legislation would make the consumer a licensee of the software firm rather than the owner of the package.

Although it provides no penalties, the proposed legislation would aid software publishers by giving them a civil, contractual claim against users who illegally copy or modify a package.

Both the bill's cosponsors — state Sen. William Atkins and state Rep. Al Alter — and its supporters made it clear that the bill is aimed at attracting high-tech firms to Louisiana. Wooley joked that measures such as this are intended to transform the state into a "Silicon Bayou."



NEWS

IBM releases enhanced version of MVS/XA

By John Gallant
CW Staff

RYE BROOK, N.Y. — IBM last week unveiled an enhanced version of its MVS/XA operating system. At the same time, the company also unveiled:

■ A Cobol product that allows programmers to write application programs for the 31-bit XA architecture as well as for the previous 24-bit architecture.

■ An option that allows users to purchase either MVS or MVS/XA and up to 70 application programs in a single package.

The latest release of MVS/XA, Data Facility Product Release 1.2, runs on IBM 4381 and larger processors. It provides expanded support for attached devices, including printers and communications devices, along with improved communications to system operators, including additional information on system requests and error tracking, according to an IBM spokesman.

The MVS/XA update also includes enhancements to IBM's Global Resource Serialization, such as facilities for improved handling of system message traffic. It supports IBM's 3290 and 3278 Model 5 terminals as operator counsel terminals, and it is said to provide additional IBM Vsam control block support above the 16M-byte virtual storage line.

IBM said MVS/XA now provides additional support for the operating system's data facility/data set functions, including the integration of Vsam data set catalog facilities. The enhanced version will be available in April.

MVS/XA Data Set Facility Product Release 1.2 has an initial license fee of $1,350 and a monthly license fee of $450. The spokesman said the system's price will increase June 1 to an initial fee of $1,484 and a monthly fee of $495.

In conjunction with the MVS/XA update, IBM unveiled VS Cobol II, described as a Cobol language product that allows programmers to write application programs for the 31-bit XA architecture as well as for the previous Cobol 24-bit architecture.

VS Cobol II provides 31-bit support for generated object programs and includes productivity and usability features that have been structured into the programming language, IBM said. The software also includes interactive debugging facilities, and performance features include reentrant object code, improved object code optimization and execution of most compiler and library functions.

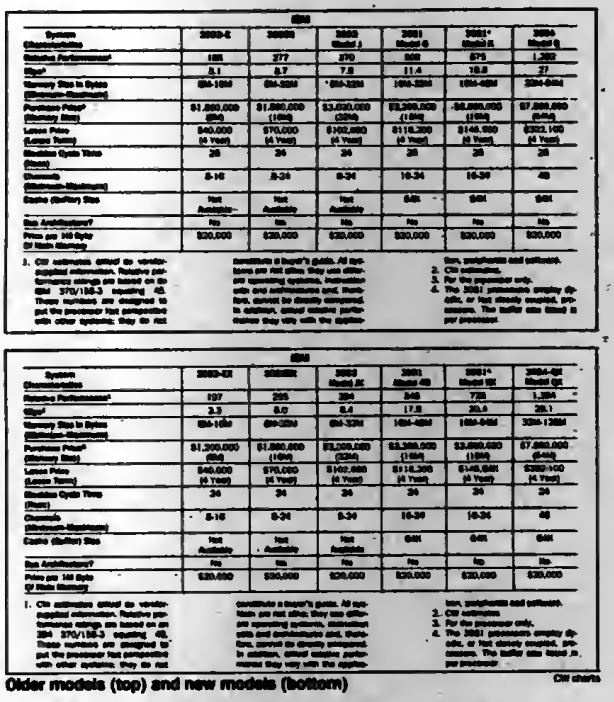
With VS Cobol II, the spokesman said, virtual storage takes place above the 16M-byte virtual storage line. The system was designed for use with IBM's MVS/370 operating system and any version of MVS/XA.

Available in the fourth quarter, VS Cobol II will carry an initial license fee of $6,000 and a monthly license fee of $1,000. The VS Cobol II pricing includes the compiler and the library.

IBM also announced a new packaging arrangement for software called the MVS Custom-Built Installation Productivity Option (Cbipo). Cbipo will allow customers to purchase either MVS or MVS/XA and up to 70 application programs in a single package, reducing the complexity of installing operating systems.

Cbipo's pricing is dependent on the operating system and applications chosen. It will be available to customers in the second quarter.

IBM's Information Systems Group is located at 900 King St., Rye Brook, N.Y. 10573.



Older models (top) and new models (bottom)

CW charts

ANALYSIS

Did IBM anticipate problems with current 3080 line?

Why IBM replaced its well-selling 3080 product line and what will happen to users of those older systems were the issues that industry analysts pondered last week.

Available in volume for slightly more than a year, the 3080 line faced little competition either from manufacturers of IBM-compatible machines or other mainframe vendors. IBM traditionally does not make major changes to a product line until it is absolutely necessary. Why, then, did it make abrupt, sweeping changes to a very successful product line this time?

One theory is that IBM detected major problems with the older versions of the 3080 line which could become evident in the future.

Charles Greco, an analyst with International Data Corp. (IDC) based in Framingham, Mass., said the migration to IBM's MVS/XA operating system is not proving to be as smooth a process as many originally felt it would be. He speculated that IBM may have realized that to run MVS/XA efficiently, users require processors offering more performance than the older 3080 models can muster.

Designed for upgrade?

Another possibility offered by Greco is that the new X models of the 3080 line may have been designed to be field-upgradable to IBM's next level of large processors, which the company is expected to announce later this year.

In either case, current users of 3080 series processors appear to be out of luck, noted William Easterbrook, an analyst with Kidder-Peabody & Co., Inc. in New York.

The resale values of the older 3080 machines will probably suffer from the introduction of the X models, especially if their successors are field-upgradable to a new line of IBM mainframes, he pointed out.

Further, Easterbrook said, users of those system will probably face a processor swap in order to migrate up IBM's product line.

IBM from page 1

3080 systems, a user who wants to upgrade from a 3081 Model K with 32M bytes of main memory to a 3084 Model Q with 64M bytes of main memory will now pay $2,896,000 instead of the previous $3,145,000 price tag.

Upgrading from a 3083 Model B to a 3083 Model J used to cost $535,000; it now costs $475,000, according to IBM.

More information is available from IBM, which announced the new line of mainframe systems through its Information Systems Division, located at 900 King St., Rye Brook, N.Y. 10573.

Agee to head new micro software venture

NEW YORK — William M. Agee, the controversial leader of Bendix Corp. before he lost the company to Allied Corp., has joined the founder of Interactive Systems Corp., developer of a Unix-based operating system for IBM's Personal Computer, in a new software venture.

Dr. Peter G. Weiner, founder of Interactive and the first commercial licensee on Unix in 1973, announced here last week the formation of Uniform Software Systems, Inc., which will be based in Santa Monica, Calif., and sell Unix-based microcomputer programs. Agee was named as chairman and Peter C. Wensberg, former president of Atari, Inc.'s telecommunications unit and longtime Polaroid Corp. marketer, was appointed president and chief executive.

"I'm not window dressing. They don't have me on the board just to raise money," Agee told reporters here last week after revealing the firm had raised but $750,000 after three initial rounds of financing. "My principal task will be to put together a more sensible financial plan and to provide top management direction."

Agee quit as president of Allied in February 1983 and has been heading Semper Enterprises, a Mass.-based venture capital firm since then.

Weiner, who gave himself the title of chairman of the executive committee, said Uniform Software's first product would be a conversion program allowing all IBM DOS software to run under a Unix-based system. The product will be offered in the third quarter of this year, he added.

"In your development center, ADS/OnLine will increase productivity and reduce your company's applications backlog." —Don Heitzmann*

**Don Heitzmann is Cullinet's Director of System Software Development. Don joined Cullinet seven years ago. His early efforts were in design and development of IDMS-DC and he is now responsible for the complete IDMS database product line. Don is a graduate of Princeton University with a B.S. in Electrical Engineering and a Masters in Architecture.*

Using ADS/OnLine Cullinet created the best applications software ever built.

The Application Development System, Cullinet's fourth generation language, became available in 1981. ADS/OnLine was the key element in our database software system needed to address the application software business in a whole new way.

We set out to develop advanced financial and manufacturing applications; applications designed in the 1980's all built using this fourth generation language. Today, Cullinet offers the finest financial and manufacturing applications available, featuring both horizontal and vertical integration. Horizontal integration means that all applications share a common database so redundancies and inconsistencies are eliminated. Vertical integration means all applications are built using ADS/OnLine and advanced database technology so they are easier to install, tailor and maintain.

Using ADS/OnLine, we developed advanced applications much faster than if we used traditional methods. In your development center, ADS/OnLine can increase productivity and reduce your company's backlog.

ADS/OnLine eliminates up to 70% of the lines of code in a typical COBOL program. This can result in a dramatic increase in programmer productivity. In addition, ADS/OnLine is easily learned by COBOL programmers, so your programming staff can become more productive in less time.

Applications can be built more efficiently with ADS/OnLine because it is a non-procedural language. The developer simply paints the screens on a terminal and fills in the blanks to define the applications program. Plus, automatic editing and automatic error handling detect input errors with no code written at all. And the complete integration of ADS/OnLine, with all Cullinet Database facilities, not only ensures control over the application development function, but also guarantees the performance necessary to run these applications in day-to-day operations.

ADS/OnLine has been a key to our success in applications software. It could do the same for you in establishing new information systems and eliminating your applications backlog in the 1980's and 1990's.

Attend a comprehensive seminar explaining this advanced fourth generation language and Cullinet's other database software products. To participate in one of the 700 Cullinet seminars scheduled internationally, send in the coupon or call 1-800-225-9930. In MA, 617-329-7700.

IDMS/R Seminar cities and dates

City & State	Date	City & State	Date	City & State	Date
Albany, NY	Mar 13	Indianapolis, IN	Mar 27	New York/Rye, NY	Mar 13
Atlanta, GA	Mar 28	Jackson, MS	Mar 15	Oakland, CA	Mar 19
Augusta, GA	Mar 14	Knoxville, TN	Mar 28	Orange County, CA	Mar 6
Boston, MA	Mar 8	Lexington, KY	Mar 30	Portland, OR	Mar 15
Bridgeport/ New Haven, CT	Mar 6	Little Rock, AR	Mar 13	Providence, RI	Mar 22
Chicago/ Rosemont, IL	Mar 20	Los Angeles, CA	Mar 27	Raleigh, NC	Mar 20
Cincinnati, OH	Mar 21	Madison, WI	Mar 15	Rochester, NY	Mar 20
Cleveland, OH	Mar 28	Meadowlands, NJ	Mar 7	San Antonio, TX	Mar 16
Columbus, OH	Mar 9	Merrimack, NH	Mar 29	Springfield, IL	Mar 9
Davenport, IA	Mar 13	Milwaukee, WI	Mar 7	Springfield, MO	Mar 20
Detroit, MI	Mar 14	Minneapolis, MN	Mar 28	Spokane, WA	Mar 28
Ft. Lauderdale, FL	Mar 22	Montreal, PQ (English)	Mar 14	Toronto, ON	Mar 20
Ft. Wayne, IN	Mar 6	Montreal, PQ (French)	Mar 21	Tucson, AZ	Mar 20
Ft. Worth, TX	Mar 15	New York, NY	Mar 20	Vancouver, BC	Mar 14
Grand Rapids, MI	Mar 27	New York/ Long Island, NY	Mar 27	Washington, DC	Mar 6
Greenville, SC	Mar 6			Wichita, KS	Mar 8
				Wilmington, DE	Mar 27
				Winnipeg, MB	Mar 6

Computer_____

Name/Title_____

Company/Department_____

Address_____

City_____

State_____ Zip_____

Phone ( ) _____

Mail to: Cullinet Software, Inc., 400 Blue Hill Drive, Westwood, MA 02090-2198 Attn: Corporate Meetings

Cullinet Software products are designed to run on IBM 360/370, 30XX or 43XX or plug-compatible computers.

CW 167

Database: Cullinet

OAC ushers in host of workstations, software

By Robert Batt
CW West Coast Bureau

LOS ANGELES — Professional workstations, enhanced software packages, information retrieval systems and communications interfaces dominated a host of product announcements at last week's Office Automation Conference (OAC '84), held here by the American Federation of Information Processing Societies, Inc.

Taking advantage of an estimated 25,000 visitors to the conference, Exxon Office Systems Co. announced its 750 Professional Workstation for executives and managers. The workstation offers text editing, business graphics and electronic spreadsheets that can be displayed and edited in multiple windows, together with a communications facility that allows the user to access outside data bases and interact with most mainframe computers.

CW AT OAC '84

Pricing for the Exxon 750 begins at $7,750; volume shipments are scheduled for the second quarter. Further information is available from the vendor at 777 Long Ridge Road, Stamford, Conn. 06902.

Also introducing a workstation at OAC '84 was Syntrex, Inc., which showed off Pisces, a stand-alone workstation featuring multiple windows, concurrent tasking and local mass storage.

The user can perform several tasks at the same time, moving information between windows while also communicating to a host mainframe, Syntrex noted. Pisces consists of screen and keyboard, designed with the Intel Corp. 80186 microprocessor and containing 384K bytes of internal memory. The standard storage module is reputed to be a 10M-byte mini Winchester drive that provides the user with on-line access to over 3,000 pages of information and a floppy disk drive with 300 pages of capacity.

Pisces is priced at $7,590 with a removable keyboard and at $9,190 with an electronic typewriter. Deliveries are scheduled for April from Syntrex, 246 Industrial Way W., Eatontown, N.J. 07724.

Datapoint software

Heralding a bunch of new office automation software packages at the conference was Datapoint Corp. Datapoint's Pro-Vista consists of a new hierarchical user interface, Vista-Guide; an electronic mail system, Vista-Mail; and an enhanced word processing package, Vista-Word.

Priced at $1,500 per component, the package is available immediately. More details are available from the vendor at 9725 Datapoint Drive, San Antonio, Texas 78284.

Four-Phase Systems, Inc. went to OAC '84 to announce the second release of its menu-driven office management software package, Coms/IV. The enhanced product reportedly provides administrative support, document filing, sophisticated electronic mail and word processing document exchange in a networked Four-Phase Series 4000/5000 and IBM host environment.

On-line application services allow the user access to other 3270 applications on the IBM system concurrent with Coms/IV, the vendor claimed.

The new product is available immediately and is priced at $32,000 for a permanent license. Coms/IV is also available on 12-, 24-, 36- and 45-month lease terms at $1,200/mo.

Four-Phase Systems can be reached at 10700 N. DeAnza Blvd., Cupertino, Calif. 95014.

With integration a key consideration for OA specialists, Integrated Office Systems, Inc. introduced its Unity System for sales and marketing organizations. The system is said to provide voice mail, electronic text mail, data entry, data inquiry and electronic telephone capabilities in one system.

The Unity package consists of two components, a portable workstation that can reportedly support both voice and data communications and a control message switch and file storage system.

Volume shipments are scheduled to begin in the second quarter. The system is priced at approximately $6,000 to $7,000 per salesman, depending on configuration.

Integrated Office Systems is home-based at 20740 Valley Green Drive, Cupertino, Calif. 95014.

In the area of information access, Northern Telecom, Inc. announced its Datascan information retrieval and reporting system for use with its Models 445, 503, 565 and 585 distributed data processing systems. The package reportedly gives users the ability to produce reports, bar graphs or histograms from information stored in data bases. Data may be retrieved using inverted, indexed-sequential, direct or sequential access methods.

Suggested software licensing fees for the Datascan package vary from

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OA efforts lack focus, Xerox chief charges

By Robert Batt
CW West Coast Bureau

LOS ANGELES — There is no clear sense of mission in automating office functions and no clear sense of urgency about the need for it, the president and chief executive officer of Xerox Corp. said in a hard-hitting keynote address to the 1984 Office Automation Conference (OAC '84) here last week.

CW AT OAC '84

David Kearns said the office of the future — "when it finally gets here," — has to be managed with clear-cut goals, operating plans, business strategies and performance plans that can be measured. "All of that has to come before an equipment strategy," he declared. "What we have to do in all our companies is figure out how to tie our white-collar workers to the bottom line."

However, given the lack of good performance measures in the office, it is no wonder that the equipment in it gets short shrift, he told conference attendees.

Pointing to personal computers as an example of this lack of goal orientation, Kearns said that micros have gotten better, cheaper and easier to justify. "But the fact that for the most part they are incompatible, that they are isolated from information stored on other machines, that many of them can't communicate, that buying them probably puts off any intelligent equipment strategy — all that gets forgotten in the compulsion to go out and buy a good little machine at a good price," he told his audience.

The focus in measuring office productivity needs to be on quality, not quantity, Kearns maintained. The role of the information manager is to invest capital in a combination of people, machines, facilities and support services. "A good information manager is constantly fine-tuning that combination. The objective is not to substitute machines for people or to cut out support services. The objective is to come up with the best mix to meet the business objectives," he declared.

Kearns

Kearns recommended a list of priorities in determining such a mix:

- First, information managers should insist on a system plan with equipment specifications and technical objectives that support the needs of the business. For example, if the business is growing, install a system that can grow with it, he said.
- Secondly, remember that communication is the one essential goal of office automation. "Remember how people think. Their ideas come in random, unpredictable patterns. Your system should help people generate those ideas easily and share them with others," he said.
- Finally, make sure the office system chosen allows people to expand the scope of their work. Doing better work should be the goal.

Kearns also warned that management itself needs to be scrutinized. American business, he maintained, tries to solve all its problems by throwing more managers at them.

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$995 to $2,495 per distributed system. The package is scheduled for availability in the second quarter.

Northern Telecom can be reached through Data Park, P.O. Box 1222, Minneapolis, Minn. 55440.

Also at OAC '84, Data General Corp. announced a series of additions to its Comprehensive Electronic Office (CEO) system. Among the additions is a telex interface, the CEO Document Exchange II system, priced at $2,500 and reportedly allowing users to send messages anywhere in the world from their CEO workstations.

DG also introduced a new word processing document interface, the CEO Document Exchange III, which lets CEO users send and receive word processing documents from other vendors' equipment. It is also priced at $2,500.

Availability for both products is within 90 days. DG is located at 4400 Computer Drive, Westboro, Mass. 01581.

The open systems philosophy was also espoused at the conference by Hewlett-Packard Co., which announced a second-generation communications network. Advancenet will provide links between HP computers and other vendors' equipment, the vendor said.

HP Advancenet includes an IBM 3278 emulator, priced at $1,200, and a network remote job entry product for communication with IBM's Systems Network Architecture costing $12,000. Both products will be available March 1.

Further information is available from HP at 3000 Hanover St., Palo Alto, Calif. 94304.

Survey by 9 to 5 links VDTs, health problems

By Lynn Haber
CW Staff

NEW YORK — A recent study of VDT operators found that stress, eyestrain, muscle pain and other adverse side effects have resulted from working with the terminals.

The survey results, outlined in "Analysis of VDT Operator Questionnaires of VDT Hot Line Callers," a report released here earlier this month by 9 to 5, the National Association of Working Women [CW, Feb. 20], indicated that health-related problems are widespread among VDT operators.

Respondents to the health history/job history questionnaire were individuals who had called a 9 to 6 hot line, part of the organization's campaign on VDT risks. Six thousand questionnaires were distributed to VDT workers from May to December 1983; 873, or 15%, of the surveys were returned and analyzed. The typical respondent was a female, 25 to 30 years of age, who worked six to eight hours daily on a plastic-cased VDT with her eyes 10 to 20 inches from the VDT screen and took the same rest breaks as other workers. Over half the respondents were clerical workers in a variety of industries; a majority had been working on VDTs for three years or less.

Severe health effects

Some of the more severe health effects reported "often or daily" by VDT operators in the survey were eyestrain, 53.5%; exhaustion, 51.6%; muscle pain, 56.2%; tension or anxiety, 43.8%; instability or anger, 26.1%; and depression, 23.6%.

In addition, 48.6% of all respondents reported diagnosis or treatment by a physician for vision problems or changes in eyesight since working with VDTs. Approximately half (49%) reported their health was slightly worse or much worse since working on a VDT.

Among the VDT users who had been pregnant since working on a VDT, 31.6% reported normal full-term delivery; 30.6% reported miscarriage; 11.7% said they had given birth by caesarean section; 7.3% had undergone therapeutic or elective abortions; 6.8% had delivered children with major birth defects (treatment required); 4.4% reported premature delivery; 3.4% reported neonatal death; 2.4% of respondents said their pregnancies ended in stillbirths; and 1.9% reported minor birth defects (no treatment required).

Of those women who were pregnant while working on VDTs, 83.8% rated their health during pregnancy as "excellent or good" and 16.7% rated their health "fair or poor."

In response to the study, Karen Nussbaum, executive director of 9 to 5 and president of District 925, Service Employees International Union, AFL-CIO, announced a second phase of the organization's national campaign on VDT risks, which calls on employers, manufacturers and government agencies to take action to protect the safety and health of VDT workers.

Nussbaum recommended that the National Institute for Occupational Safety and Health (Niosh) investigate a work site where a cluster pregnancy problem was recently discovered; that Niosh follow through on a feasibility study of pregnancies among women workers, including VDT users, as soon as possible; and that Niosh set up a national tracking system to study patterns of VDT-related health problems across the U.S. and suggest solutions.

VOTE from page 1

minicomputer that does the tabulating once we get the ballots from the state police. We'll have a final count about two days after the primary," Ambrose said.

Automated voting is confined to the larger cities and towns, such as Manchester, Concord, Salem and Portsmouth.

These communities rely on equipment that ranges from mechanical lever-action voting machines to punched-card booths and card readers.

It is not scheduled for use tomorrow, but a new system eventually may speed the vote count in Salem. The town plans to try as a pilot a precinct ballot counter produced by Computer Election Systems, Inc. of California.

That counter, scheduled for use in a municipal election next month, would count the votes at the precinct level as voters feed it punch cards throughout the day. When the polls close, workers would then unlock the machines at each of six polling places and read the results in seconds, according to Town Clerk Eleanor Barrett.

Comparing even the current card system, which involves several hours of vote counting, with the paper system she used when she started counting votes in 1965, Barrett noted, "It's sure a lot better than what we used to do, when we would be here until four in the morning."

Opponents of proposed VDT laws organize

By Lynn Haber
CW Staff

WASHINGTON, D.C. — As legislative attempts to regulate the use of video display terminals in the work place have grown, opposition to such regulation has also mounted.

Among those opposing the legislation are trade groups and associations such as the Computer Business and Equipment Manufacturers Association (Cbema), the American Banking Association, the American Electronics Association, the Air Transport Association and the American Insurance Association.

"We have opposed all the bills that we've seen so far — other than study bills — not because we don't believe that there aren't any problems connected with the work place or with video display terminals, but [because] the so-called solutions that we've seen mandated in the bills . . . would do more harm than good," said a spokeswoman for Cbema. A national group, Cbema has 40 members, including such computer companies as IBM, Digital Equipment Corp., Honeywell, Inc., Sperry Corp., Texas Instruments, Inc. and Apple Computer, Inc.

At the Air Transport Association, representing the major airlines, which currently use more than 75,000 VDTs nationwide, "Our position is that we don't believe we should be burdened with legislation requirements unless there's a demonstrated need," a spokesman said. "As far as we know, there has been no such demonstrated need for such legislation."

Legislative efforts to regulate VDT use have surfaced in Massachusetts, Connecticut, Illinois, Maine, Oregon, New York, Ohio and Rhode Island. Both Connecticut and Maine have passed legislative study bills, but no state has yet adopted regulatory legislation.

Other attempts to regulate the use of VDTs in the work place have included adding VDT-specific language to union contracts (CW, Sept. 26).

The U.S. trails Europe on the VDT issue. In countries like Sweden, Switzerland and West Germany, federal regulation has mandated the use of adjustable chairs, terminals with detachable keyboards and rest breaks for operators.

Typical bill

The recently drafted Ohio House Bill 552 is typical of many VDT regulation bills.

Its stated purpose is to require minimum occupational and health and safety standards for VDT operation; it would require that VDT operators be provided with adjustable chairs and tables, tilt screens, detachable keyboards, individual brightness and contrast controls, noise-reduction covers and metal shielding on the transformer of the VDT to block radiation.

The bill would also mandate rest breaks for workers, maximum exposure limits and free yearly eye exams provided to users by their employers. A pregnancy consideration clause requires employers to offer work alternatives at the same work site to pregnant VDT operators.

Cbema objects to proposed legislation like the Ohio bill because it "aids the notion that there's something unsafe about these machines, when there isn't," the Cbema spokeswoman said.

"We've looked at the radiation question, and we looked at the radiation literature that deals with pregnancy-related hazards, and as a responsible organization we just can't condone legislation that asks for alternate work for women during their pregnancy.

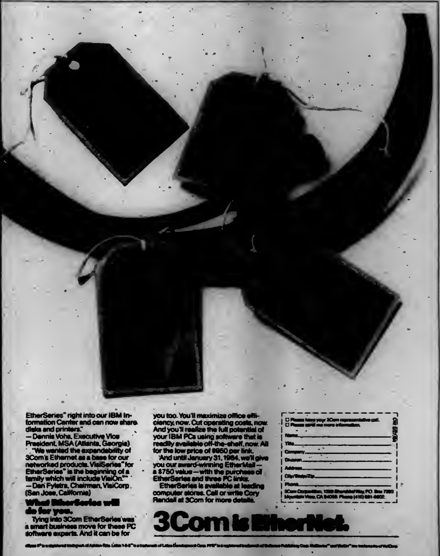
"It doesn't seem any more valid to us to say that terminals could be a possible cause of birth defects than it does to say light bulbs could be a possible cause of defects," the Cbema spokeswoman said.

Studies on the effects of VDT usage, such as those made by the National Institute for Occupational Safety and Health (Niosh) in 1981 and the Newspaper Guild in 1983, have acknowledged VDT-related health risks such as eye strain and muscle fatigue.

Studies examining radiation emissions and the effects of VDTs on pregnant operators are being done, but presently there is no conclusive scientific evidence linking VDTs to pregnancy problems.

A spokeswoman from the Printing Industry of America (PIA), which is part of a coalition of VDT users groups organized by Cbema to act against regulatory legislation, said PIA is opposed to legislation, not to the recommendations of Niosh, which include better ergonomically designed work areas.

"We're concerned that employees are encouraged to become more fearful of the equipment by the scare stories being told. The unions are using it as an organizing tool, as one has to keep it in mind that there's politics going on and not just a concern for the employees on the part of the promoters of that legislation," the PIA spokeswoman said.



Voice/data problems seen growing

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — Incompatibility and downtime, familiar problems to computer users, are posing an increasing threat to voice/data telecommunications users, consultant Howard Frank said here last week. And he indicated that the problems arising in the wake of AT&T's recent divestiture are going to get worse, possibly much worse.

Frank, who is president of Contel Information Systems, Inc. and an authority on the design and implementation of communications networks, told a conference sponsored by the Institute of Electrical and Electronics Engineers (IEEE) that the growing difficulty of obtaining reliable telecommunications service is due partly to vendors. Because of the growing integration of data processing and communications, vendors expert in one of these fields are now trying to sell functions from the other, but in many cases haven't yet "built up sufficient skills or reliable product lines.

"Office automation vendors add further uncertainty and instability as they extend their product lines to contain both DP and communications features," he said.

Another reason telecommunication services are becoming less reliable and more expensive, Frank said, is that user companies have underpaid and "under-resourced" their communications departments. This is ironic in a way, he indicated, because of "the competitive opportunities arising from enhanced communications. For example, a recent advertisement by a major bank emphasized its worldwide communications network as its major point of superiority over competitors."

The trend toward common data processing and communications technology will "inevitably" require the merger of the related departments, Frank added. Although this merger is beginning to take place, it is frequently "accompanied by destructive corporate power struggles."

Keeping telecommunications operations from becoming gridlocked will require better-trained systems managers and administrators, Frank said. Universities are not providing such people, he maintained, and the short courses offered by private organizations to those already on the job are —with some exceptions — "abominable."

Better education

Frank's answer to all of these problems starts with better education. Network users and component suppliers must fund university-based courses tailored to the current need, he said.

These are long-term remedies, Frank said, adding that the immediate problem is to "survive the next few years," especially the uncertainties created by AT&T's divestiture and the related tariff changes.

To reduce that problem, Frank advised Congress to adopt a hands-off approach toward "the post-divestiture environment."

ICA seeks deferral of AT&T CPE rate hike

WASHINGTON, D.C. — The pending increases in AT&T lease prices for installed terminals should be deferred, the International Communications Association (ICA) told the Federal Communications Commission last week.

The reason: AT&T has failed to comply with an FCC order issued last December that requires AT&T Information Systems, Inc., AT&T's terminal marketing subsidiary, to lease installed (embedded) terminals known as customer premises equipment (CPE) at specified rates for two years after offering them for sale [CW, Dec. 5]. The ICA, whose members include most of the nation's largest companies, told the FCC that:

- AT&T has announced that the "lease price predictability program" will begin, with an increase in present rates, on March 1 this year and run until Jan. 1, 1986. The FCC order called for a 24-month program.
- The FCC order specified that during the 24-month program, AT&T would be allowed to raise its lease rates in three steps spaced eight months apart. AT&T's notice to customers said the "maximum lease price will be achieved on July 1, 1985, a full six months before the end of the two-year transition period," according to ICA.
- A survey of ICA members showed AT&T Information Systems has failed to give its embedded CPE customers "firm sales quotes in writing." Under the FCC's December order, this information must be available before the 24-month price predictability program can begin.

Commenting on the ICA action, an AT&T spokesman said the FCC ruling allows the price predictability program to begin "when the company has notified all affected customers in writing that we have initiated a sales program." AT&T Information Systems sent out those notifications in December, so it believes that establishing Jan. 1, 1984 as the starting date complies with the FCC order.

FCC rejects tariffs filed by local carriers

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — The Federal Communications Commission has rejected the charges for accessing long-distance, private-line and dial-up services that were proposed by most of the nation's local telephone companies last October. The FCC action raised the possibility that the current, generally lower rates for all long-distance, inter-Lata (Local Access and Transport Area) communications services will continue beyond April 3, the date they are scheduled to end.

The tariffs rejected by the FCC on Feb. 15 specified the carriers' proposed charges for circuits connecting subscribers to inter-Lata MTS, Wats and private-line circuits.

The rates reflected the FCC's previously adopted access charge plan, under which the costs of local telephone service were redistributed.

Raised prices

As a result of this redistribution, the former Bell operating companies and other local telephone companies, according to the commission, have raised their prices for some services by 800%.

"The magnitude of the increases makes it clear that the telephone companies are proposing to change radically the manner in which local private lines are priced and provided," the FCC said in its rejection order.

The commission added that "the present filing provides virtually no information on these matters."

The carriers must resubmit their tariffs, together with adequate justification, by March 15. However, this deadline may not allow them enough time.

A related problem is that the commission staff will have only about two weeks after March 15 to review the submitted material — which is bound to be voluminous — and make recommendations to the commission.

A further complication involves AT&T, which also submitted a tariff to the commission last October embodying the new access charge plan. Like the local carriers' proposed rates, those filed by AT&T are presently scheduled to become effective April 3.

AT&T's pending tariff includes a "total service" option, under which the company combines its own facilities with connections obtained from local carriers and charges the end user a consolidated price.

Since the price for each total-service option cannot be determined until the local carriers' charges for their facilities are in place, AT&T probably will be unable to submit its final rates to the commission until after March 15.

AT&T's Brown attacks order issued by FCC

The same day the Federal Communications Commission rejected the tariffs filed by local telephone companies, AT&T attacked the changes recently incorporated into the commission's access charge plan.

The FCC order "will drive our interstate earnings to levels which are about half of those authorized for the nationwide interstate long-distance business," AT&T's Chairman Charles L. Brown said.

Brown's statement is believed to presage a substantial cutback of the savings AT&T promised early last month [CW, Jan. 16].

The specific charges probably will be disclosed next month, when AT&T is likely to file revised rates for long-distance, inter-Lata (Local Access and Transport Area) MTS, Wats and private-line services that embody the latest version of the commission's access charge plan.

October filing: 15.3% increase

In its October filing, AT&T proposed a 15.3% increase overall in private-line rates and a 10.5% decrease in MTS and Wats.

Last month, the company said the increase could be less and the decreases greater if the FCC stuck with the original version of its access charge plan, in particular, a $2/mo surcharge on residential users beginning April 3.

However, a short time later, the commission, responding to pressure from the U.S. Congress, deferred that surcharge until next year, along with a similar fee imposed on single-line business users.

In his recent attack on the FCC decision, Brown said that as a result of the residential surcharge deferral, "two billion dollars in additional expenses has been loaded on AT&T Communications. . . . It is important to understand that AT&T is no longer a huge monopoly which can offset such blows as this with earnings from other jurisdictions."

AT&T to offer shared multitenant services

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — AT&T's unregulated subsidiary announced plans early this month to offer "intelligent building services" that would provide tenants of office buildings with access to long-distance private-line services and sophisticated private branch exchange services.

Landlords of office buildings in major cities have begun offering such services in recent years at prices considerably below what the tenants could obtain on their own. AT&T Information Systems, Inc., the unregulated AT&T subsidiary, wants to contract with the landlords to provide the supporting facilities.

With communication rates spiraling upward, these "shared, multitenant communication services" are likely to become considerably more popular, since they offer a way of canceling or at least sharply reducing the higher charges.

AT&T Information Systems has agreed in principle with United Technologies Corp. to form a joint-venture company that would provide shared, multitenant services. If the proposed marriage between AT&T and United Technologies is consummated, it will almost certainly make the whole idea of these services more credible to office building landlords and their tenants, besides creating a supplier with the resources needed to launch a major marketing effort.

However, because of the Federal Communications Commission's Second Computer Inquiry decision, AT&T Information Systems cannot offer most private-line services. They are classified as "basic" services and thus have to be provided under tariff by regulated common carriers such as AT&T Communications.

AT&T Information Systems recently asked the FCC to waive this provision of Computer Decision II, indicating that, otherwise, the proposed joint venture would come unstuck, and "several near-term venture projects" would have to be abandoned.

However, the proposal to amend Computer Decision II has evoked opposition from several parties, and they are believed likely to feel the same about the waiver.

One opponent is the Independent Data Communications Manufacturers Association which, in a recent comment that it made to the FCC, said that allowing AT&T Information Systems to resell services would enable AT&T to turn over to its subsidiary "the most advanced and lucrative portions of the transmission business."

Suit accuses MCI of billing unfinished calls

By John Dix
CW Staff

CHICAGO — Users of long-distance telephone services provided by MCI Communications Corp. should be on the lookout for phantom phone charges.

In a class-action suit recently filed here against MCI, Certified Collateral Corp. alleged that MCI sometimes charges its customers for calls which are not completed. This is done "deliberately, knowingly and with the intention to deceitfully and fraudulently obtain moneys" to which it is not entitled, Certified Collateral claims in its suit. According to Certified Collateral, this fact is not disclosed in MCI's filings with the Federal Communications Commission nor in the company's residential and commercial rate schedules.

Additionally, Certified Collateral alleges that "these improper charges were reversed by the defendant only if discovered by the customer and reported to the defendant."

An MCI spokesman said that a booklet for new installations provides a number to call for questions regarding bills and that any inappropriate charges are reversed. While the company agrees that the overbillings can occur, the spokesman said that the regional telephone holding companies do not provide MCI with the "answer supervision" function that AT&T Communications enjoys.

Without this feature, which enables a carrier to know when a call is completed, MCI has had to adopt a billing system whereby its computers monitor the noise on a line to distinguish between ringing sounds, busy signals and conversation. "This system isn't perfect," the MCI spokesman said, and can result in some calls being billed that are not completed.

This system is also at fault, he added, for Certified Collateral's allegation that calls which ring six or more times before they are answered may incur a charge of a "minute or more in addition to any actual communications."

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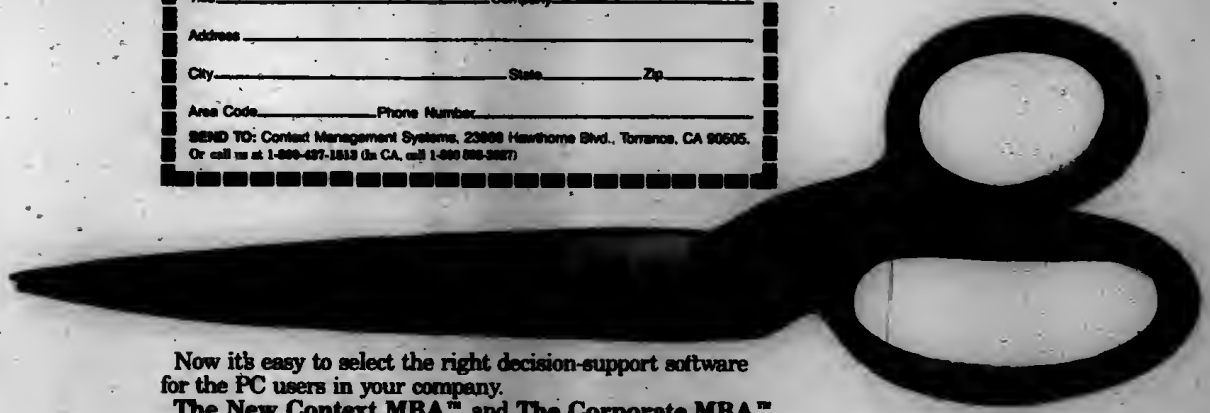

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NEWS

Bank MIS chiefs talk about merger planning

By Paul Korzeniowski
CW Staff

When companies merge, "the key to integrating data processing departments is to make the transition transparent to customers and employees," said Arthur Johnson, vice-president of the Automated Systems Development department at the Shawmut Bank of Boston. "Terminal operators and customers should be able to access data without having to stipulate which bank produced it."

Johnson speaks from experience. His bank last year bought Worcester (Mass.) County National Bank. Both Johnson and Truman Hester, another veteran of a bank merger, estimated that it will take two or three years before data processing activities are fully integrated.

Hester is senior vice-president of Sovereign National Bank, created last year by the merger of Virginia National Bank in Norfolk, Va., and First National Bank in Richmond. "The two banks' operations and data processing departments began working together eight months before the merger took place," Hester noted. "We wanted the departments to be familiar with one another, and we had to integrate the two personnel systems.

"On the day the merger was signed, one personnel and human resource system was used at both banks." After the personnel system was implemented, "we prioritized our applications and began integrating the most important applications first."

In both the Massachusetts and Virginia mergers, automated teller machines (ATM) were the first application to be integrated. "At first, each bank's ATM application ran independently," Hester said. "Communication hardware allowed us to tie the two systems together so a customer could complete a transaction at either bank. Today, a central data base holds customer information for the ATM system. We plan to use the data base when we integrate other applications."

Currently, most Sovereign applications run independently at both data processing centers. "We would like to design a system so that one mainframe processes applications and the other could be used for batch and emergency processing," he said.

Shawmut took a different approach. "We are evaluating each bank's version of an application," Johnson said. "When we determine which version meets our needs, we will use that version and continue to run it at its present location. When we have completed this process, both mainframes will probably process the same number of applications."

IBM mainframes

The conversion process in both mergers has been aided by the fact that all the banks use IBM mainframes. "Since both data processing departments used IBM's [Systems Network Architecture], we were able to develop communication capabilities quickly," Hester said.

Data conversion required more effort. "No two data file formats were the same," Johnson said. "We didn't encounter many major conversion problems, but it did require a great deal of work."

While a chief benefit of a merger should be reduced operating costs, "Since the merger, we haven't eliminated any positions," Hester said. "We expect that our staffing level will remain constant throughout the integration process." But, he added, "As we fully integrate applications, staff may be reduced. We don't plan on laying any employees off; any staff cuts will come through attrition."

Software AG slates April users conference

ANAHEIM, Calif. — Software AG of North America, Inc. will hold its 13th Annual International Users Conference here at the Disneyland Hotel and Convention Center April 29-May 3.

John Naisbitt, chairman of the Naisbitt Group, author of *Megatrends: Ten New Directions Transforming Our Lives* and publisher of "The Trend Report," will deliver the keynote address.

The conference will feature guest speakers, user presentations, workshops and education classes for all levels of the company's users.

Some of the classes being planned include "Adabas Physical File Design" and "Natural Security."

Registration is $595. Further information is available from Software AG, 11800 Sunrise Valley Drive, Reston, Va. 22091.

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'Collector' of DP programs gets probation

AKRON, Ohio — Apparently "just a collector," a DP consultant reportedly accumulated copies of tire company computer programs that cost more than $100,000 to develop.

It was only by chance that officials found the manufacturing and utility programs that Alfred C. Buxton Jr. of Akron had stored in his desk at General Tires, Inc. and in an apartment where he kept a minicomputer, according to a prosecutor.

Buxton was placed on probation after he pleaded guilty to a conversion of trade secrets charge relating to his copying printouts as he translated a program for The Goodyear Tire and Rubber Co., where he worked as a consultant in the late 1970s.

That program, according to Summit County Assistant Prosecutor Richard Dobbins, was a tire curing process program that cost Goodyear more than $30,000 to develop and was worth as much as $1.5 million to Goodyear's competitors.

Buxton allegedly left that program in a loose-leaf binder in his desk at General Tires when he quit a programming job there last year. A coworker found it by accident and reported it to General Tires' legal department. "We never would have known otherwise," Dobbins noted.

A police search uncovered three General Tires programs in one of two Akron apartments that Buxton kept. According to Dobbins, Buxton fed at least one of those programs to his Lobo Drives International small business computer's disks via telephone hookups at General Tires. Two of those reportedly were program development systems, while a third was a program designed to run industrial equipment manufactured by Akron Standard Mold Co., the company where Buxton worked when finally charged with conversion of trade secrets, possession of stolen goods and possessing criminal tools (the computer) last November. The remaining charges were dropped when he pleaded guilty to the conversion of trade secrets charge.

"It originally looked like he was selling them. But we became convinced that he didn't. He was just a collector keeping this stuff around for his own use," Dobbins said.

Buxton, who passed a polygraph examination, maintained he was only a collector and had what turned out to be improper permission from tire company officials to take programs home to work on at night, Dobbins noted.

Data erasure at weapons firm investigated

By Patricia Keefe
CW Staff

OAK RIDGE, Tenn. — A seemingly minor incident in the eyes of DP employees at the Y-12 nuclear weapons parts plant here has come under the spotlight as a result of a federal government investigation into allegations of missing uranium at the facility.

The discovery last June of what plant officials said is the accidental erasure of data — for which backup reportedly exists — from 27 computer tapes was revealed during a hearing held Feb. 6 by the U.S. House of Representatives' Armed Services Committee's Subcommittee on Investigation. Also investigating at the request of Joe LaGronde, the manager of operations at the plant, is the U.S. Department of Energy (DOE), which contracts with Y-12.

The investigations were initiated after a series of stories appeared in the *Knoxville News-Sentinel* of Tennessee, concerning alleged uranium inventory discrepancies at the plant. The stories focused specifically on the whereabouts of 1,710 pounds of uranium.

A reporter for the *News-Sentinel* said plant officials told DOE about the tapes only after his inquiry about them the day before. Since the tapes contained uranium accountability inventories, there was some speculation that the tapes might have been deliberately erased as part of a cover-up concerning the missing uranium.

George Jansy, vice-president of engineering and computer science at Union Carbide Corp., which operates the Y-12 plant, dismissed those allegations, saying that backup in the form of printouts, microfiche and files exists for the data that was erased.

"You have to understand that [the tape erasures] were uncovered last June during a routine housekeeping process, and the people involved considered it a purely internal matter," Jansy said.

A spokesman for the Subcommittee on Investigations said the subcommittee was satisfied with Y-12 officials' responses to the charges.

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French town to try out medical smart card

By Susan Blakeney
CW Staff

BLOIS, France — Imagine walking around with your entire medical history — records of every doctor visit, prescription and treatment you ever had — in your back pocket.

This is exactly what people here will be doing, thanks to smart card technology. Smart cards resemble credit cards, but in addition to a magnetic signature band, they contain an embedded programmable microprocessor equipped with logic and memory. Originally developed by Honeywell Bull SA for retail and banking applications, they are now breaking new ground with the medical application.

That $3 million government-funded project was devised by Intelmatique, a coalition of 40 independent information companies (including Honeywell Bull) and the French government. According to Roy Bright, managing director and chief executive officer of Intélmatique, it will encompass three separate pilot programs using the chip-on-a-card technology.

Distributed to school children

The first program in the project will be launched early this year with the school children of Blois, a small city southwest of Paris. Minister for Social Affairs Pierre Beregovy said the smart cards will be distributed in the school system to maintain individual vaccination records.

To support the program, card readers will be issued to all schools and physicians in the region. A card reader can display and update a card holder's entire permanent file.

"Ultimately, we hope that an individual health card could be created for every member of the population," Beregovy said. "This would lead to improved health care by reducing delays in treatment, eliminating duplicate medical tests and ensuring correct emergency care."

The two other medical applications slated for implementation later this year involve patients requiring frequent hospital treatment — both the chronically ill and outpatient cases, such as people undergoing dialysis, Beregovy said.

"These applications will greatly facilitate the appointment and treatment process," Beregovy maintained. "At the same time, these patients, if they move, will not have to face repetitious and expensive medical examinations" each time they relocate. The automated procedures will also simplify and streamline the clerical and recording processes in hospital administration routines, Beregovy added.

To ensure that privacy is maintained in the use of the smart cards, all medical applications will be supervised by the National Commission for Computer Technologies and Civil Liberties, Beregovy noted. Furthermore, the cards feature built-in security devices that make them especially well suited to medical applications.

"Individual privacy is assured by the powerful but flexible security mechanism designed in the card," Intelmatique's Bright said. "It has three levels of security for data protection, ranging from 'open' to 'secret,'" he added. (Many retail and banking smart cards operate with identification codes; when a code is entered improperly or used fraudulently, the microprocessor in the card self-destructs.)

Bright predicted that the growing number and scope of applications for smart card implementations in France will create a wide interest and acceptance of the technology in a wide array of industries abroad.

So far, smart cards have been adopted by French university students as portable school records; they're being used to make direct-billing phone calls from special French phone booths; and to make direct-billing purchases at many of France's retail stores. Smart cards are also scheduled to become a part of the French pay-TV network.

NEWS

INTERNATIONAL REPORT

CW INTERNATIONAL NEWS NETWORK

AUSTRALIA

SYDNEY — Less than six months after signing an agreement to distribute its accounting software through Wang Computer Pty. Ltd., Attache Software has struck distribution deals with Wang's parent company in the U.S. and completed negotiations with three other major microcomputer vendors in Australia. The most significant of the local deals is a $1 million pact with IBM Australia Ltd.

■

CANBERRA — Agridata Resources, Inc.'s Agridata Network has been chosen as Australia's national agricultural information network. Slated to be introduced this summer, Agridata Network is said to be the first U.S. on-line electronic information system adopted for widespread use in Australia, where the British Prestel system is dominant.

■

HAWTHORN — IBM Australia Ltd. has donated an IBM 4341 mainframe and associated peripherals, valued at approximately $1 million, to the Swinburne Institute of Technology here. Swinburne will establish a computer-aided design and manufacturing center for teaching and research applications.

BRAZIL

RIO DE JANEIRO — Brazil's Special Department of Informatics has initially qualified eight Brazilian companies to produce superminis. Three of the companies (Cobra, Sid and Labo) will rely on domestically produced technology. The remaining five (Bradesco, Sisco, Itautec, Edisa and ABC-Sistemas) will import technology: Bradesco will buy from Digital Equipment Corp.; Sisco will import from IPL Systems, Inc.; Itautec will purchase Formation, Inc. equipment; Edisa will use Fujitsu Ltd. technology; and ABC-Sistemas, whose proposal for a joint venture with Hewlett-Packard Co. was rejected by the government, will import technology from CII-Honeywell Bull.

CHINA

BEIJING — In conjunction with China's Ministry of Machine Building, IBM sponsored an advanced computer course to familiarize some 30 Chinese government ministers with computer applications and also to establish a friendly IBM image in the People's Republic, a ministry spokesman said.

■

BEIJING — A software development center called the China Software Technical Corp. has been established here by China's Computer Industry Administration under the nation's Ministry of Electronic Industries (MEI). The center, one of several newly formed software groups, will coordinate the developmental efforts of all MEI's subordinate organizations.

■

BEIJING — In an attempt to modernize and increase economic efficiency, China is expected to import $1 billion worth of advanced technology in 1984. Last year, China's computer imports totaled $300 million, said Yuan Baohua, vice-minister of the State Economic Commission.

FRANCE

PARIS — After dissolving its joint-venture agreement with Datapoint Corp., Matra Informatique appears to be re-entering the minicomputer marketplace — this time with the Norwegian vendor Norsk Data A.S., which offers a range of minis for scientific, industrial and transactional applications. In order to establish a joint venture with Norsk, Matra must first get permission from the French Ministry of Industry.

JAPAN

TOKYO — Fujitsu Ltd. has announced plans to build a factory in the U.S. It is rumored that the proposed factory will be built in California to produce computer-related devices such as magnetic disks.

■

TOKYO — NEC Corp. claims to have created the world's first single-chip processor that is not a von Neumann-type system. The system was designed for image processing. First shipments of the NEC processor are slated for June.

WEST GERMANY

MUNICH — Industry watchers here predict IBM Germany GMBH will cut prices by up to 20% as its 3080 processors on March 1. The speculation comes in the wake of IBM's unofficial announcement of a new pricing strategy made to customers interested in buying new data processing equipment.

■

MUNICH — Siemens AG has unveiled its three-model 7.590 series of mid-range computers. The 7.590 processor is based on emitter-coupled logic technology with large-scale integrated circuits. A basic configuration with 300M bytes of disk storage and four display stations (plus the vendor's BS 2000 operating system) starts at approximately $107,000. First shipments are slated for early 1985.

NEWS

Supermini helps scientists 'read' language of DNA

By Peter Bartalik
CW Staff

MADISON, Wis. — In science fiction writer Frank Herbert's latest novel, *White Plague*, an embittered scientist uses a computer to map human deoxyribonucleic acid (DNA) — the molecular building block of genes — and develop an almost unstoppable virus that kills all infected women.

A project at the University of Wisconsin at Madison's University-Industry Research Program here makes no claims to the potential for evil, or good, that could be wrought with the genetic engineering abilities foreseen by Herbert. But it is using a computer to enable scientists to "read" more easily the language of DNA.

"DNA sequences are the coding stuff for the software of life," explained John R. Devereux. With partner Paul Haberli, Devereux developed a program that runs on a Digital Equipment Corp. VAX-11/780 supermini under VMS and enables engineers to compare a DNA sequence against about 3,000 sequences stored in the computer's memory. "We are developing ways to look at that [DNA] so we can know what it is."

Fully understanding the codes contained in DNA and being able to mani; ulate those codes would open "overwhelming" possibilities, Devereux said in a recent interview with *Computerworld*. Scientists could determine if a DNA sequence in a particular strain of corn contains a particular amino acid that increases corn's feedstock value. Similarly, he said, a clinician trying to treat people with genetic diseases might be able to take a DNA sequence from a person, alter it slightly to conform to a normal pattern and reintroduce it into that person's body where, theoretically, it would "spread and correct the deficiency."

While the medical example is the alter ego of Herbert's doomsday disease, Devereux said the ethical considerations of such power will be determined by society. "Like any powerful technology, it opens up avenues for abuse," he said, adding that it's his belief "the levels of diabolicalness already established are so good" that there is little need for using genetic engineering to create new monsters.

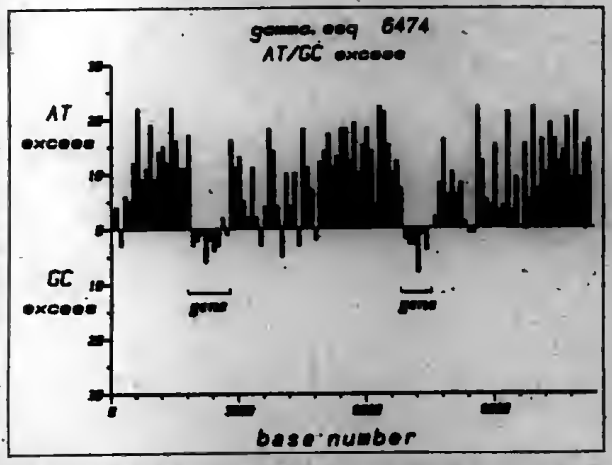
Devereux uses his program to compare new DNA sequences against those already stored in the computer memory. The computer sorts through its base of sequences to determine if the new sequence has any similarities or patterns to existing sequences. That may enable scientists to determine if the new sequence has similar functions to a known sequence or if it is unusual.

There are probably more than three million DNA sequences that have been identified and published, according to Devereux. His project has stored 3,000 sequences ranging from those in bacterial viruses to those of human blood genes.

DNA is found in the form of a helix-shaped staircase containing millions of steps. Each step is a pair of nucleotides, named a base, which may occur in either of two combinations: an adenine-thymine (A-T) pair or a cytosine-guanine (C-G) pair. A grouping of three pairs, called a codon, provides a code for one of 20 amino acids that form proteins. Identifying a sequence is a matter of reading those As, Ts, Gs and Cs.

An actual gene may be tucked away within a long strand of DNA, and Devereux's computer can pinpoint areas that are likely to contain genes. The computer can also indicate what areas on the DNA strand are vulnerable to the cutting action of specialized enzymes used by genetic engineers to pry out genes.

The sequences are read from patterns of dark bands exposed on X-ray film and are then input by keyboard.



On this bar graph of the AT and GC content of a human fetal DNA sequence, the genes for two different blood pigments are indicated by excesses of GC bases. The molecule is the most flexible where there is an excess of AT bases since this region is not transcribed into a protein.

Poll surveys large companies on their OA equipment requirements

By Lynn Haber
CW Staff

WELLESLEY, Mass. — Compatibility of office automation equipment becomes increasingly important to users as company size increases, according to a report recently published here.

Less than 10% of very large companies (those with annual revenues of $250 million or more) would forego compatibility to get the best equipment from the best individual vendors, they recently told Venture Development Corp. (VDC), which mass-mailed a survey to approximately 10,000 companies.

In contrast, 40% of those companies with $5 million to $20 million in annual revenues would be willing to sacrifice compatibility to get the best equipment from the best individual vendors.

Acquisition analysis

The results of the survey were published in a report titled "Office Automation Survey: Analysis of Acquisition and Use of Office and Communications Equipment."

The survey's response rate was approximately 7%; respondents included company presidents, communications managers, managers of systems and data processing, senior systems engineers, vice-presidents in marketing and finance, engineering and system applications engineers and systems analysts.

Large companies are also more concerned than smaller companies that future purchases mesh effectively with currently owned office equipment. According to the researchers, products are evaluated with an eye to compatibility specifications as well as functionality. This contrasts with small firms that often buy equipment to suit an immediate need, with less thought to a systems-oriented approach.

Interest in compatibility

According to Leone Nancy Pease, VDC market research analyst, the stronger interest in compatibility is attributable to the fact that larger companies are usually more automated and have a greater diversity of location and type of equipment that need to communicate with both external locations and international locations.

Cost of equipment and acceptance by users were also cited as vital concerns by more than 20% of the companies questioned. Proper planning of equipment purchases and management cooperation each concerned about one company in eight.

According to the VDC survey report, the overriding theme today among office automation equipment buyers is caution. Many companies are underautomated, yet reluctant to get in over their heads with an expensive automation structure that may become obsolete in the near future.

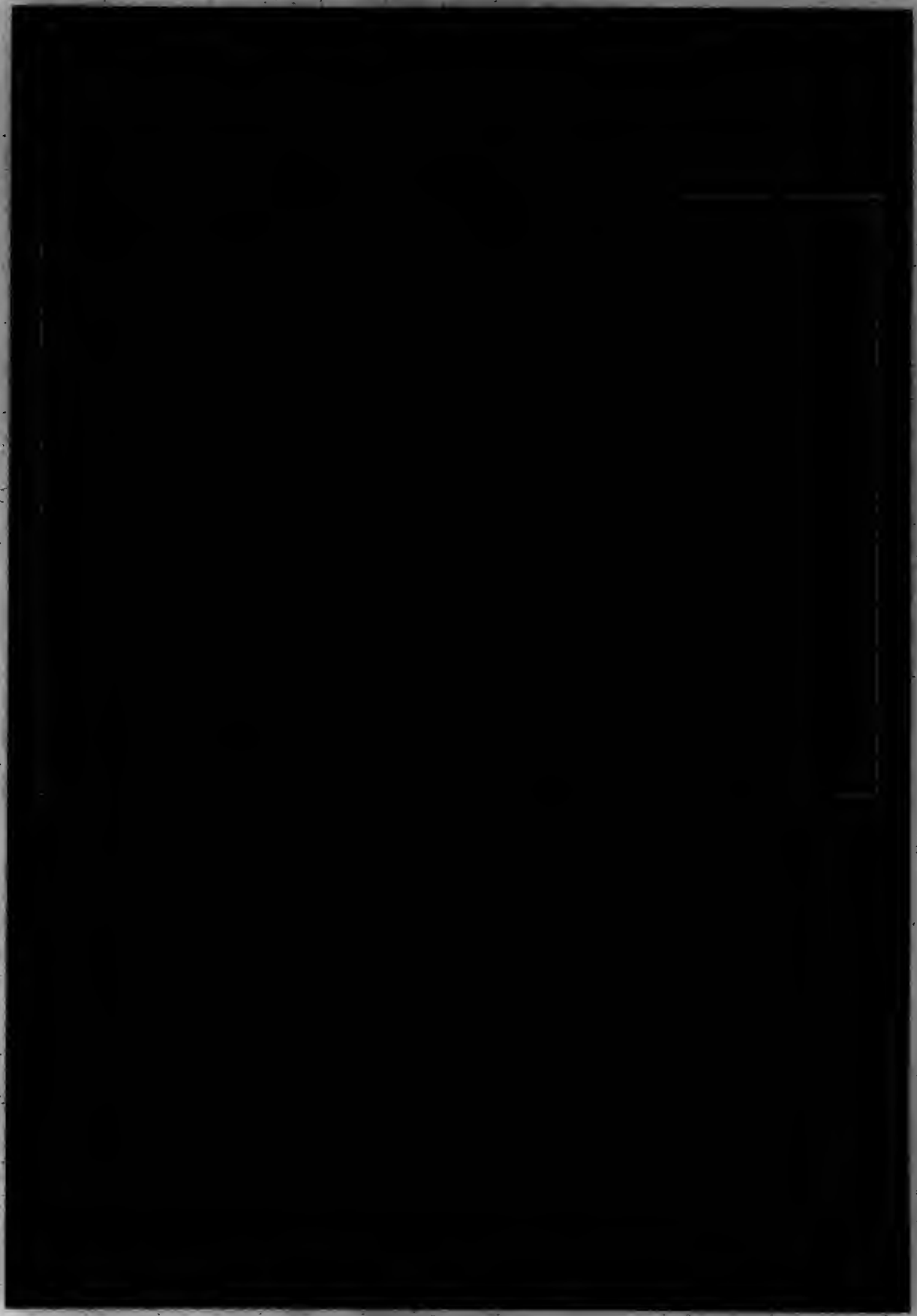
VDC believes many companies are waiting for communications and software standards to be set and for vendors to sort themselves into product and service categories clearer to the potential buyer of equipment. But, the researchers warn, this "wait-and-see" attitude does not help the user to solve immediate problems.

Concern about shakeouts

According to the study, some buyers even expressed reluctance to buy from anyone but IBM because so many vendors are in financial trouble. Continued concern about shakeouts in such categories as personal computers and electronic typewriters has led purchasers to be wary of parts and service problems with unstable vendors.

VDC noted that the successful office equipment vendor, in addition to providing effective products, will also give some degree of assurance of being in the business for the long term.

The report costs $1,850 and is available from VDC, One Washington St., Wellesley, Mass. 02181.



Teleconferencing net keeps workers home

By Paul Hemmelgarn
CW Staff

Like most people, Charles Aronovici wakes up every morning, dresses, eats breakfast and goes to work. But unlike most workers who battle traffic or subway crowds, Aronovici only has to walk from the dining room to a computer terminal to reach the office. He and five co-workers for The Adesse Corp. in Ridgefield, Conn., are tied together by a teleconferencing network that Adesse manufactures.

"We designed the system so we could attract quality personnel without requiring that they move to Connecticut," said Jerry DePass, president of Adesse, which makes software utilities for companies with IBM VM/CMS operating environments. Its employees are located in Pennsylvania, Massachusetts, Connecticut and Canada. Telephone lines, multiplexers and modems connect the company's programming and marketing personnel.

"A message facility allows employees to talk to one another," Aronovici said. "Since we have access to each other's files, employees can electronically discuss any plan. Whenever an employee completes a task, he assigns it a file name. Other employees can look through the file, insert notes and highlight benefits. An electronic mail feature notifies the author of any changes. The author can incorporate or amend them," he added.

The system has its limitations. "Since there is no face-to-face communication, there is the risk of misunderstandings," Aronovici said. "Since our employees have experience with the system, we have few misunderstandings. At first, some people may take notes or corrections personally — even though they are not meant that way. Whenever there is a serious problem, someone can pick up the telephone and talk to the person."

Teleconferencing provides benefits. "Working with this type of system is different from a normal office," DePass said.

"Since there is no body language, employees have to develop skills to utilize the system fully. I think that they concentrate and put more thought into an item before sending it. They do not want to waste words, so when they use the system, their message is usually clear and concise. At a meeting, people often talk just for the sake of talking. A lot of time is wasted."

DePass thinks that the time needed to complete a project is saved. "Since employees do not have to schedule a meeting to discuss an issue, the system increases productivity," DePass said. "If someone has a question at 3 a.m., he asks it then, rather than waiting for a weekly staff meeting."

Adesse does not hold staff meetings or planning conferences. "The workers only meet on social occasions," DePass said. "We have one meeting a year. It is purely social; there really is no need for other meetings."

Since employees work at home rather than at the office, the temptation exists to play rather than work. "Employees work more, rather than less," Aronovici said. "Since the system is always available, if one wants to work at night or during the weekend, one can. The terminal acts as my conscience."

Adesse's small size is tailor-made for teleconferencing. "If a company had more than 50 employees, there may be a problem using this type of system," DePass said. "There is nothing inherent in teleconferencing that prevents larger companies from using it. But larger companies lack the support mechanisms necessary for this type of system."

Rebuilt vote counter saves county $144,000

By James Connolly
CW Staff

CHATTANOOGA, Tenn. — A decision to retrofit its 10-year-old vote counting equipment gave a local election commission a faster and more versatile system for a third the price of new equipment.

When it was time for the Hamilton County Election Commission to upgrade its punch-card vote tabulating system last year, Registrar Rick Wilson looked for ways to speed up not only the vote count, but to computerize voter registration lists. With automated voter lists, the county hoped to save some of the $40,000 per year that service bureaus charged to process them.

The company that installed the county's vote counting system in 1974, Computer Election Systems, Inc. (CES), quoted a price of "roughly $200,000" for a new package that would replace the 4K-byte, 600 card/min ballot tabulator with a 128K-byte, 1,000 card/min system with disk drives and monitors. Instead of paying $200,000 for that new system, however, Wilson found a company that would recondition and retrofit the old equipment to produce a system comparable to the CES system for only $56,000.

"We wanted to increase the card reader speed from 600 up to 1,000 [cards] per minute, but the most interesting things were the disk, the disk-tape backup and the screens. We wanted some type of computer system that could be used to computerize registration. We've always had to send that out to a job shop," he added, noting that voting lists in the county of 300,000 are in constant flux with new voters and address changes. The county, which includes Chattanooga and vicinity, has an average of 150,000 registered voters.

Wilson contacted Don Baumer, a former CES employee and now president of Diverse Integrated Systems, Inc. (DIS) of Concord, Calif. He asked Baumer what could be done to upgrade the county's system.

Rebuilt equipment

"We completely rebuilt the card counter. We tore the guts out and brought it up to 1,000 cards a minute," Baumer said of the Documation, Inc. 3008 vote counter.

To the Data General Corp. Nova 1210 processor, Baumer added a board utilizing a chip based on the Fairchild Camera and Instrument Corp. 944516 microprocessor, which increased the CES Ballot Tab's memory from 4K to 128K bytes. He also added five Liberty Electronics Co. USA Freedom 100 terminals and a 160M-byte Priam Corp. 15450 disk drive. In addition, as election night protection, DIS upgraded a backup processor from 4K to 16K bytes.

The system is already handling voter registration tasks as clerks transfer data from paper registration cards into the system via the terminals.

On election days, beginning with the May 1 presidential primary, poll workers at 57 voting sites are expected to have up-to-date registration lists. Voters, as they have for a decade, will use CES Votomatic ballot stands and punch cards to vote. The votes will be stored at the polling places and shipped in steel boxes to election commission headquarters in Chattanooga, where they will be processed on the two card readers.

The system, now undergoing final conversion, will receive its final test in the May 1 primary.

"It's not absolutely new computer technology, but for us it is a dramatic new application. I do think that it has been very much worth pursuing. The fact that it all cost only $56,000 still seems unbelievable," Wilson concluded.

Confused buyers unite against micromania

By Lynn Haber
CW Staff

As the computer evolution moves full speed ahead, some people feel as though they're sinking in its wake — and they have something to say about it.

The Crabapple Anti-Computer Club was founded last month as an outlet for consumers who don't believe that home computers are for everyone, despite the sales pitches. The Society for the Prevention of Cruelty to Users (SPCU) was established for users of IBM Personal Computers who are feeling battered by their software.

Steven M. Stroum, 35, is the founder of the Crabapples. A technical publicist with his own company and claiming over 1,900 accounts, Stroum is familiar with the technology and a believer in the advantages of computers, but vehemently objects to the marketing strategies used by the home computer industry, some of which "hit below the belt on an emotional level."

"I believe that computers aren't a fad, that they are in fact a part of our society and that they have a role and a place; that I have no problem with," Stroum said. "What I'm opposed to is the promotion that implies: 'Average parent, unless you buy your child a computer, you're going to be neglecting that child. You're going to be an inferior parent, and you're going to be responsible for your kid failing.'

"That heavy-handed approach needs to stay with cosmetics and deodorant. I don't think it has a place with high technology and computers."

The Crabapple club, which presently has only about a half-dozen members, will publish six newsletters a year. Its objective will be to provide people with a real idea of what's involved with computers and to help them determine whether they really need a computer.

"If the companies that have been involved in the home computer market could do as fine a job with determining the needs of that market as IBM has done in determining the needs of the small business market," Stroum said, "I think we'd have a different ball game. It's that type of responsibility that I'd like to see."

Annual membership in the Crabapples is $19. Further information is available from Crabapple, P.O. Box 3236, Framingham, Mass. 01701.

SPCU for IBM users

The SPCU was founded to help IBM Personal Computer users better understand available software programs.

"Most people complain that what they learned from advertising was what features a particular software program offered, but rarely did they get a straightforward assessment of how well each of the features worked," said founder Charles J. Spezzano, a psychologist. "They found it difficult to assess from all the glowing ads what it was that they needed."

The society, which Spezzano said resulted from his own frustrations with his Personal Computer, currently has 200 members. For $36 a year, society members receive a monthly newsletter and four special reports.

Personal Computer users are not discontented with their micros, Spezzano noted. Instead, "it seems that the main problem that people have is in shopping." He thinks Personal Computer users are looking for a *Consumer Reports* type of magazine on software.

Further information on the SPCU is available from Spezzano at 6716B E. Cedar Ave., Denver, Colo. 80224.

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MANAGERS ON THE MOVE


Harris

LINDA HALL HARRIS has been named director of information services for Honeywell, Inc.'s Residential Division. In her new capacity, she will be responsible for providing business information and communication services to the information services division and for implementing office automation.

Harris joined Honeywell in 1980 as strategic planning manager for the Energy Products Center. Most recently she was manager of international and interdivisional marketing for Energy Products.

Prior to joining Honeywell, Harris had 10 years of experience as a psychologist.

She received a B.S. degree in special education and an M.A. degree in psychology from the University of Michigan. She also holds a doctorate in educational administration from the University of Minnesota.

■

WILLIAM D. STOWBRIDGE has been appointed vice-president of management information systems for Dataproducts Corp. in Woodland Hills, Calif.

Stowbridge most recently was a managing principal with JIA Management Group, Inc., a Los Angeles computer consulting firm. Prior to that, he served four years as corporate director of management information systems at Denny's, Inc. and a similar period at Rockwell International Corp. as director of computing services in the Eastern Region as well as corporate director of systems planning and control.

Earlier in his career, Stowbridge was associated with IBM's Data Processing Division as well as with the Bell system.

He attended Elgin Community College and the University of Illinois at Champaign.

■

DAVID J. HERSH has been appointed manager of engineering systems/management information services for Air Products and Chemicals, Inc. in Allentown, Pa.

In this position, he will be responsible for developing and implementing engineering computing systems for Air Products and Chemicals, an international supplier of industrial gases and equipment, chemicals and engineering services.

Hersh joined Air Products in 1968 as a participant in the company's career development program. He has held positions of increasing responsibility within the company's Process Systems Group and has served as manager of engineering information systems prior to his recent appointment.

He holds a B.S. in chemical engineering from Lehigh University in Bethlehem, Pa.

IEEE society fire called disaster story with happy ending

SILVER SPRING, Md. — An electrician dropped his wrench on a 480V wire during the course of some maintenance work at the Institute of Electrical and Electronics Engineers (IEEE) Computer Society's East Coast office here three weeks ago, starting a fire that DP manager Jim Barrett said caused the disk drives to "flash like pinball machines" as the building's transformers blew up.

But even though electricity went on and off for more than a minute, there was no damage to the Digital Equipment Corp. PDP-11/44 and two DEC Professional 350s or to the backup data files. "I guess you could call this a disaster story with a happy ending," Barrett said.

When, on Feb. 8, smoke filled the eight-story building housing the IEEE Computer Society's administrative office, book publishing and conference and tutorials division, IEEE employees grabbed disk packs and hurried down six flights of stairs to safety.

Staff members Nancy Heinbaugh and Margaret Brown were hit with polyvinyl dichloride dust when power boxes exploded in their faces. They were treated at a local hospital and released the same day.

IEEE Computer Society staff members worked at home for about a week, waiting for electricity in the building to be turned on again. "We set up five or six cottage offices," said Chip Stockton, director of the IEEE press.

"We were able to do a lot with typewriters as well as take advantage of a networking system we set up in September called Compmail. Through Compmail, we can take advantage of several personal computers we have out in the field," he said.

For the week while the East Coast office was closed, administrative operation of the society was handled by the society's Los Alamitos, Calif. office.

Two to share award from IEEE

SAN FRANCISCO — Two vice-presidents of Valid Logic Systems, Inc. of Mountain View, Calif., have been chosen to share the Institute of Electrical and Electronics Engineers Computer Society's W. Wallace McDowell Award.

Dr. Thomas M. McWilliams and Dr. L. Curtis Widdoes will receive the honor for "creating the Structured Computer-Aided Logic Design [Scald] methodology, which is the basis for many of the successful computer-aided engineering systems used in the industry," according to a society spokesman. The Scald methodology is a three-part approach to the design of computer logic, which uses interactive graphics entry of designs, a high-level language and automatic verification tools.

Widdoes, who is Valid Logic Systems' chief scientist, and McWilliams began work on the Scald methodology while designing supercomputers at the Lawrence Livermore Laboratory in California in 1975. By 1978, they had produced a first-generation methodology.

"I'm quite honored," Widdoes said. "Frankly, the people who've gotten the award in the past — Gene Amdahl, Seymour Cray — are people I've looked up to all my life."

IBM exec to keynote ACM meet

CHICAGO — An IBM marketing support consultant for workstations will deliver the keynote address at the Association for Computing Machinery's (ACM) two-day North Central Regional conference, "Making the Micro-to-Mainframe Connection," to be held here March 22-23.

The conference will investigate solutions to microcomputer integration problems in a mainframe-based data environment. IBM's Morton Sinkoff will examine the emerging trends and future directions of microcomputers, integrated workstations and personal computing in the work place from technological and marketing viewpoints. He will also discuss the implications of these trends for business, scientific and academic users.

A 24-year veteran of IBM, Sinkoff is responsible for establishing the strategic directions of IBM workstations. He previously served as the company's manager of academic and scientific programs for the IBM Personal Computer.

Full conference registration is $95 for ACM members and $105 for nonmembers before March 1. After March 1, registration is $120 for ACM members and $130 for nonmembers.

Further information is available from North Central ACM '84 through P.O. Box 2381, Chicago, Ill. 60690.

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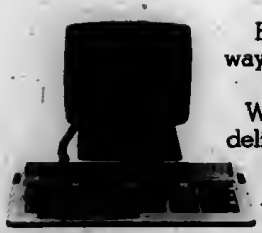

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NEWS

CALENDAR

WEEK OF MARCH 11

MARCH 16-17, HOLLYWOOD, FLA. — **Rebalancing SAS Technical Support Skills (OS).** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

WEEK OF MARCH 18

MARCH 19, CLEVELAND — **Micro-PCS.** Contact: Evaluation and Planning Systems, Inc., Suite 1540, 110 Plaza, New York, N.Y. 10119.

MARCH 19, NEW YORK — **Introduction to the IBM Personal Computer.** Contact: Center for Advanced Data Processing, Inc., Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

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EDITORIAL

The VDT scare: reason to pause

Warning: Working on a VDT may be hazardous to your unborn child.

Could that warning show up in computer ads and on VDTs before long?

The National Association of Working Women, better known as 9 to 5, has been campaigning against the health risks of VDTs since last May. Earlier this month, the 12,000-member organization of office workers called a press conference in a midtown Manhattan hotel to blazon discovery of a "cluster site" of pregnancy problems.

According to 9 to 5, fully half the women who became pregnant while working on VDTs at an airline telephone reservations office in San Francisco since 1979 suffered miscarriages, stillbirths or premature deliveries or saw their children come into the world with birth defects. The group also released a six-month nationwide survey in which women "who reported becoming pregnant since working with VDTs could claim only a 31.6% rate of normal, full-term delivery."

Harrowing statistics. Karen Nussbaum, executive director of the group and president of a national office workers' union, called the numbers "truly frightening" and "shocking enough to demand immediate action." It would be "irresponsible to dismiss this situation without more study," she declared.

Radio and television reporters in New York responded at once, spreading word of the pregnancy risks caused by VDTs.

But few bothered to quote a Columbia University physician brought to the press conference by 9 to 5. According to Dr. Jeanne M. Stellman, there is "no proven link" between VDTs and pregnancy problems. There is not even any "evidence of widespread pregnancy problems among VDT workers," she said.

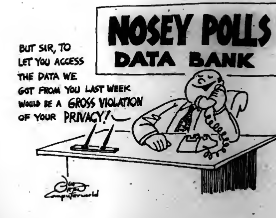
And anyone who has had a few moments to study the 9 to 5 figures might find in them reason to pause. In San Francisco, only 48 pregnancies over a four-year period were tabulated; in the nationwide survey, only 206 pregnancies were counted among the nation's 10 million VDT operators. A mathematician would point out that such an "n" — the statistical sample — was too small in both cases to support sweeping charges.

What is more, the "cluster" of pregnancy problems in San Francisco could be the result of any number of causes ranging from environmental factors — heavy cigarette smoke, exhaust fumes, nearby radioactive wastes — to statistical chance alone.

This is not to shrug off the possibility of a long-range health hazard from VDTs. As Mark A. Pinsky, editor of *VDT News*, cautioned, radiation from display terminals may have graver effects than now suspected. But this must be studied coldly and rationally, not in a manner designed to raise fear.

Nussbaum scoffs and brands as "insane" the suggestion that 9 to 5 might be raising fears among VDT workers. But women we know who heard radio reports of the 9 to 5 accusations were ready to quit their jobs as word processing operators and cancel their orders for home computers.

The effects of VDTs upon their operators' health must be studied coolly, rationally and thoroughly to prevent VDT radiation from becoming, like asbestos, a hazard that is discovered too late. And someone must speak out for the interests of VDT users. But by making charges based, at best, on incomplete data, 9 to 5 has clearly abused — if not abdicated — that role.



LETTERS

Three cheers for Charles P. Lecht: 'A fine addition' to the paper

Three cheers for Charles P. Lecht's article "Pundits and predictions" [CW, Feb. 6]. What better bit of humor to have topped off my afternoon of "getting the 'right stuff.' "

I look forward to his next round of intellectual humor — perhaps a go at terminology.

Lecht's column is a fine addition to *Computerworld*.

Lucille Bocchicchio
New York, N.Y.

Expected analysis of findings, got rehash of Naisbitt's ideas

Having enjoyed and been provoked by John Naisbitt's *Megatrends*, I was excited to see J. Daniel Cougar's In Depth article "DP megatrends" [CW, Feb. 6]. I expected from the article a thoughtful analysis of Naisbitt's findings with respect to MIS.

What a disappointment. Cougar only rehashed Naisbitt's ideas and in a much less interesting fashion.

Any of your readers who skips the book due to reading the article will be missing out.

Daniel Coleman
DP manager
The Village Co.
Chapel Hill, N.C.

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VIEWPOINT

Develop your information center in phases

THE DATA CENTER

JOHN P. MURRAY

You have your information center in operation. Through a diligent effort, combined with a well-thought-out and carefully executed internal sales and marketing campaign, much has been accomplished. A great deal of the routine clerical effort has become a standard function of the information center. Automated spreadsheets, the computerized production of charts and graphs and the ability of MIS clients to produce many of their own reports are examples of the progress that has been made. The goal of the information center has been reached. Or has it?

It is interesting that when the information center effort begins, the usual goals revolve around the issues of the reduction of clerical effort in order to speed up reporting processes and, perhaps, to help hold down increases in the clerical staff. In addition, from the MIS perspective, another goal of the information center process may be to help stem the growth of the use of microprocessors.

While some organizations have had more difficulty than they should in reaching this goal (many have not yet reached this goal, some probably never will), the development of this environment should be viewed not as the end, but only as the completion of the primary phase in the building of the information center environment.

The attainment of this primary level of information center service may create a feeling of complacency within both MIS and the client departments. At this point, MIS attention may begin to focus on other areas, and the further development of the information center and progress toward areas in which real growth can be realised may begin to stagnate. Such a situation must not be allowed to develop; once the information center has been accepted, when the MIS clients begin to use it and identifiable results are forthcoming, MIS should begin to step up the effort to push for its use in areas in which dramatic results can be realized.

The introduction of the information center as an approach to reduce clerical effort and to speed the development of basic information outside the MIS department is a valid approach, but it should not be viewed as the ultimate goal of the information center effort.

It may not be a common occurrence that every organization that plans for the development of the information center environment will understand right from the start that once the basic clerical processes are computerized, the state will then be set for much more effective methods to help move the organization ahead, but that is indeed the case.

The introduction of the information center as an approach to reduce clerical effort and to speed the development of basic information outside the MIS department is a valid approach, but it should not be viewed as the ultimate goal of the information center effort. . . . The ability to use the organization's data, to build information center data bases that can then be manipulated to help middle- and senior-level management to obtain a clear understanding of the effect of different situations, moves the MIS contribution to the organization into areas in which its real value can begin to be understood.

Given that the organization has a reasonable record of success with its information center effort, that clients are using the computer to do much of the work they formally did by hand and that, as a consequence of those circumstances, they are willing to consider doing more, MIS management should continue its effort to expand and refine the information center function. The same principle applies here as it does to the overall issue of the MIS function: If a solid information center function is not in place, it must be developed prior to attempting to explore new horizons.

A point of movement to the next phase of the information center should be the process in which, with the help and encouragement of MIS, the clients who are now comfortable with the information center function begin to move from the processing of basic information to the area in which using that information as a base, the power of the information center can be used to address such areas as forecasting and modeling.

The ability to use the organization's data, to build information center data bases that can then be manipulated to help middle- and senior-level management to obtain a clear understanding of the effect of different situations, moves the MIS contribution to the organization into areas in which its real value can begin to be understood. Such a situation can only be of benefit to all concerned.

As an example, the organization's inventory information is available through the information center.

Using that data as the base, the client can build a model that will address questions such as, "What is the effect on cash flow of a 10% reduction in inventory?" "How would such a reduction affect the 'safety stock' requirements?" and "Is the increased cash flow worth the potential exposure to the manufacturing process that would occur as a result of the safety stock reductions?"

These are rather basic questions. Any organization should be able to answer them without an information center, right? Well, perhaps, but it is not now being done in many organizations, with or without an information center.

Simple experiment

In fact, if you have a sound information center in operation, why not try a simple experiment. Ask appropriate managers several "what-if" questions about their areas of business. Once you have their answers, build a model in the information center, using the department's data, and see if the answer is the same. If nothing else, the result may open up areas of discussion about the movement to the next phase of the information center.

It would be my guess, if the model is right, that your answer will be different from the manager's. If the manager does not have a closed mind, and if you are able to verify the correctness of your answer, your effort to move to the second phase of the information center should be much easier.

The development of the information center process is an evolutionary process that, in order to be most effective, should be done in phases. ‡

Murray is director of management information services for Rayovac Corp., Madison, Wis., and author of Management Information Systems as a Corporate Resource, *published by Dow Jones-Irwin.*

Another approach to building DP-user relationship

HUMAN CONNECTION

JACK STONE

It takes only a few triumphs on a personal computer, for example, generating statistical reports and five-year forecasts for the boss in hours rather than days, to turn a 97-lb DP user weakling into a fire-breathing computer person.

But from a DPer's point of view, the latter is a far better person to work with than a user steeped in ignorance and clouded with confusion.

With the proper communications environment — a series of letters, briefings, meetings or training sessions, depending on the style of the organization — the data processing department can help to bring the "experienced" user out of the clouds and back down to the earthly reality of production computer systems.

Work that must be accomplished

A large part of this reorientation involves explicit explanations about the tough, unsung, dirty work that must be accomplished — tasks that so many DPers are typically all mired up in — to get operational systems on-line and to keep these systems there.

In short, new users have little appreciation for what it takes in the way of systems support and how it has taken years and years for many first-rate data processing organizations to develop and maintain dependable information systems.

But what is really significant here is that the timing is right for another new approach to building relationships with users, namely, training in "systems realities," subjects that DPers have taken for granted for years, but rarely have conveyed to the user population because the needs were not there.

Up-and-coming user

The up-and-coming user is the one with an experience base of personal computers and an elementary appreciation of the complexity of systems problems.

I believe that this type of user would welcome communication and training from the DP establishment on systems matters and would develop a better understanding of the contribution of DPers to the firm.

Users want to, and should, know about such topics as:

■ *Backup.* Most users have no idea of what is entailed in backup procedures beyond the duplicate disk and file copy utilities. As hard disks continue to enter the marketplace — a technology that still raises questions of reliability — and more critical files find their ways into their storage, users are courting file-loss disasters until they install proper methodologies for backing up the files.

■ *File sharing.* In spite of the rapid developments in office automation, capabilities whereby two users can access the same file at the same time continue to be limited. The result is that large files must be reorganized into smaller ones and periodically recombined for global report generation. Getting this all together on a routine, timely basis — and correctly so — is a hairy job for the best of the DPers.

■ *Vendor relations.* Dealing with the vendors requires varying blends of political savvy, in-depth knowledge of technology, human relations in times of intense stress, the wisdom of Solomon and the patience of a saint. Those DPers who have survived the ordeal represent a source of critical strategies and tactics that should be transferred to the user population posthaste.

I can't guarantee what such information exchanges will achieve, but I suspect that the users will express their undying gratitude. ‡

Letters to Stone should be addressed to him at P.O. Box 33680, Washington, D.C. 20033.

VIEWPOINT

Getting straight about the use of FBI's NCIC

READER'S PLATFORM

KIER T. BOYD

After reading the editorial "And now, 1984" (CW, Jan. 9), I was concerned that *Computerworld* misled its readers about the use of the Federal Bureau of Investigation's National Crime Information Center (NCIC) and some of the proposed changes to enhance the NCIC system.

Since 1967, NCIC has been a valuable asset to the criminal justice community, which accesses it more than 400,000 times a day. For the past several years, the NCIC Advisory Policy Board has been planning changes to increase the system's effectiveness by various means, including the creation of new files.

Since 1967, NCIC has been a valuable asset to the criminal justice community, which accesses it more than 400,000 times a day. For the past several years, the NCIC Advisory Policy Board (APB) has been planning changes to increase the system's effectiveness by various means, including the creation of new files. Suggested new applications come from both the APB and outside entities, such as local police departments, probation and parole officers, the President's Commission on Violent Crime and so on.

The editorial mentions two suggested changes:

- A proposal to list known associates of wanted felons against whom an arrest warrant was outstanding.
- The NCIC Secret Service file.

The depiction of the reader's cousin being listed in NCIC because she baby-sat "for a mobster's sister-in-law" alludes to the proposed known associates file. This hypothetical situation was never envisioned for such a file. Obviously, the baby-sitting cousin is not an associate of a wanted felon. In any case, the proposal for a known associates file was rejected by the APB last October and will not be reconsidered.

The Secret Service file was created at the request of that agency. The U.S. Department of Justice's Office of Legal Counsel has determined that its existence is lawful. The U.S. Congress has apparently agreed, for although some members of a congressional oversight subcommittee attempted to cut off funding for the NCIC Secret Service file, the full committee rejected this attempt.

The Secret Service file, incidentally, contains information on 85 to 100 people who are serious threats to one or more of the service's protectees. That's a small fraction of the more than 9,000 cases the Secret Service investigates yearly.

Proposed new files

There are a number of proposed new files in the preliminary stages of consideration. Before there can be informed debate on their merits, specific criteria must be developed concerning the nature and quality of information that must exist before a file entry can be made, the specific uses that can be made of the information, to whom the information will be given and in what form and the standards for data quality and retention.

These matters will be considered by the APB at its public meeting and by the director of the FBI. Of course, Congress will be consulted, and Justice's opinion concerning the legality of the proposed files will be obtained. Before any implementation, the new uses will be published in the *Federal Register*.

All of this is done to ensure that the need for these files is substantiated and that all issues of personal privacy are thoroughly considered and discussed and problems resolved before any changes in NCIC occur.

'Network is open to anyone'

Finally, one other statement in the editorial concerns me. It states, "In some states the network is open to anyone and is used by many firms to see if job applicants have criminal records."

That statement is not accurate.

The data on wanted persons and stolen property is public source information and readily available through NCIC; the criminal history data to which the editorial refers is also public source information, but is not readily available. It may only be accessed pursuant to federal statute and executive order for certain limited licensing and sensitive employment purposes. ‡

Boyd is acting assistant director, Technical Services Division, FBI, Washington, D.C.

IN DEPTH

The One-Minute Manager

Lessons from the best-sellers

A three-part series

Part three

The message to DP management is that effective feedback need not take a lot of time. Shortcutting can be carried to the extreme, however. Imagine a "One-Second DP Manager" shaking his finger in a "one-second reprimand" or giving the thumbs up "one-second praising." With equal efficiency, the subordinate responds, "Acknowledged!"

By J. Daniel Couger

The phenomenal success of *The One Minute Manager* (William Morrow and Co.) has been an enigma to academicians in the management field. The chairman of a regional academic meeting on management concluded: "The book contains not *one* idea new to the field, nor *one* idea that has not been previously described in other management books — in much greater depth."

Admittedly, the scope of *The One Minute Manager* is limited. Just 106 pages and replete with white space, the book contains fewer than 15,000 words. It is only 15% the size of *Megatrends* and 10% the size of *In Search of Excellence*, the other two management books high on the best-seller list the past six months [discussed in this series, Jan. 16 and Feb. 6].

Sales of more than one-half million copies in the $15 hardcover edition indicate that purchasers saw a value far in excess of cost per word. The book is now also available in paperback for $6.95.

The combined background of the authors (Kenneth Blanchard, a management consultant, and Spencer Johnson, a psychologist) results in a humanistic counterbalance to managerial efficiency that makes the book unique in the field.

The book is highly readable because its message is presented allegorically, as a fable about a legendary person — the "One-Minute Manager."

The story concerns a "bright young man who was looking for an effective manager. He wanted to work for one. He wanted to become one."

The book begins at the end of his search. The young man (whom I'll refer to as the interviewer) discusses with the manager and his subordinates the reasons for his effectiveness. The authors define effective managers as those who "manage themselves and the people they work with so that both the organization and the people profit from their presence."

The effective manager says that he is neither an autocratic nor a participative manager. "I care about people *and* results," he says. "They go hand in hand."

Why is he called the One-Minute Manager? "I call myself that because it takes very little time for me to get very big results from people," he

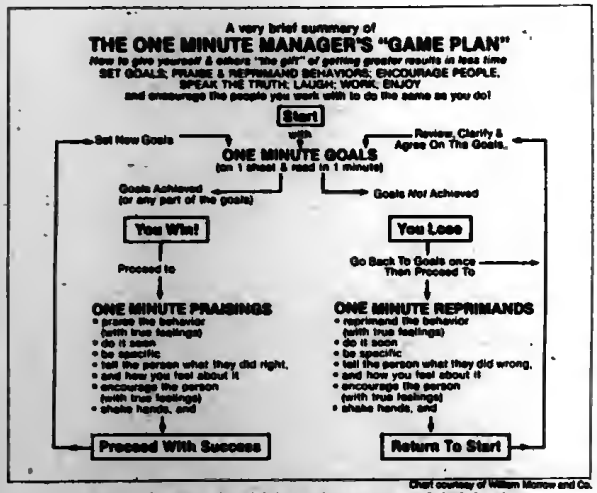

Chart courtesy of William Morrow and Co.

Figure 1. Blanchard and Johnson's summary of their book

tells the interviewer.

Why translate the book's lessons to the DP environment? Should not the general management principles presented apply equally well to DP management?

Couger, Zawacki and Associates developed a data base on more than 6,000 people from which we derived motivation norms for 18 jobs within the computer field. That data base shows the special characteristics of DP employees and their managers. General management concepts apply to this particular environment, but require translation to be most useful.

Blanchard and Johnson do not have the logical orientation of the DP manager. The concluding section of the book, for example, provides "The One-Minute Manager's Game Plan," a chart summarizing the key points. Surprisingly, this chart omits several factors stressed in the book.

Discrepancies in the book's graphics will be obvious to most people in our field, where logical analysis and graphics go hand in hand. The "game plan" is confusing because it does not distinguish activities of the supervisor from those of subordinates. The items listed under "praisings" and "reprimands" are clearly actions recommended for supervisors. The boxes "you win" and "you lose" imply that the manager wins or loses. The book never mentions either. Instead, it stresses that managers should let their people operate as independently as possible, once goals have been mutually established.

Implicit is the idea that "the organization" wins or loses depending on how well people perform. The book does not explicitly state that the supervisor/subordinate collectively win or lose, although the chart should be interpreted that way.

Figure 2 converts the Blanchard/Johnson chart (Figure 1) to correct the deficiencies. The revised version explodes the goal-setting portion of the chart, emphasizing the book's content most appropriate for DP management.

The Blanchard/Johnson chart makes it difficult to determine who originates the goals — managers or subordinates. The text, however, clearly indicates that only in the case of inexperienced subordinates are the goals originated by management. That fact is reflected in Figure 2, which also clarifies actions to be performed by subordinate or supervisor and those performed in concert.

Also missing from the Blanchard/Johnson chart is the relationship of individual goals to organizational goals. Unfortunately, this important factor is also missing from the text.

Another problem with the chart is the implication that goal statements are prepared and negotiated for all goals. The text states that "one-minute goal setting" occurs for only 20% of the goals — the three to six goals most important for that subordinate's area of responsibility. The chart also implies that the manager is not involved in selecting the top 20%, that the subordinate brings those goals into the discussion. While the book's strength is its conciseness, the section on goal setting is brief to the point of being not only incomplete, but misleading.

"With true feelings," the parenthetical statement at the bottom of Figure 1, may look strange to those who have not read the book. The authors are trying to emphasize that managers should express their dissatisfaction with an employee's poor performance. A subordinate tells the interviewer that the One-Minute Manager "shares with me how he feels about it — he's angry, annoyed, frustrated or whatever he is feeling."

The Blanchard/Johnson chart accurately conveys the book's strengths vs. its weaknesses. The one line devoted to goals in the chart reflects the book's sparse coverage of the subject. Three-fourths of the chart is devoted to praising and reprimands, consistent with the amount of discussion in the book.

The seven-step procedure for one-minute praisings is provided in Figure 1. The philosophy behind the procedure is, "The most important

thing in training somebody to become a winner is to catch them doing something right — in the beginning, approximately right — and gradually moving them toward the desired behavior."

According to the book, "Most managers wait until their people do something exactly right before praising them. As a result, many people never get to become high performers because their managers concentrate on catching them doing things wrong. . . . [They] periodically zap them just to keep them moving. This is the most popular leadership style of all."

A key attribute of the effective manager is praising subordinates, even if things are not going well for him elsewhere. According to one employee, "He responds to where I am, not just where he is at the time."

"Remember," The One-Minute Manager says, "you don't have to praise someone for very long for them to know you noticed and you care. It usually takes less than a minute."

The effect is cumulative. A subordinate says, "After a while you begin to catch yourself doing things right and you start praising yourself." He concludes with a comment that sounds more like a statement for a bumper sticker than a management book: "If you don't blow your own horn, someone else will use it as a spittoon."

One-minute reprimands

Surprisingly, only half of the nine-step procedure for the one-minute reprimand is listed in the Blanchard/Johnson chart. In addition, the chart omits the evaluation procedure; hence the elaboration in Figure 2. The Blanchard/Johnson chart shows that if goals are not achieved, they are rediscussed once; a recurrence precipitates the one-minute reprimand.

Compared with the text, the Blanchard/Johnson chart is misleading. As soon as the manager is aware of a problem, he goes to the subordinate. "First, he confirms the facts." Then he "looks me straight in the eye and tells me precisely what I did wrong. Then he shares with me how he feels about it."

Moreover, he does not attack the subordinate as a person. A subordinate tells the interviewer, "The manager reprimands only my behavior — it's easier for me not to become defensive."

The Blanchard/Johnson chart's omission of the last four steps in the reprimand procedure is especially inexplicable because these steps relate to a principle the authors heavily stress throughout the book. As shown below in the full procedure, the second half of the reprimand is designed to conclude the session on a very positive note.

1. Tell people beforehand that you are going to let them know how they are doing and in no uncertain terms.

The first half of the reprimand:

2. Reprimand people immediately.

3. Tell people specifically what they did wrong.

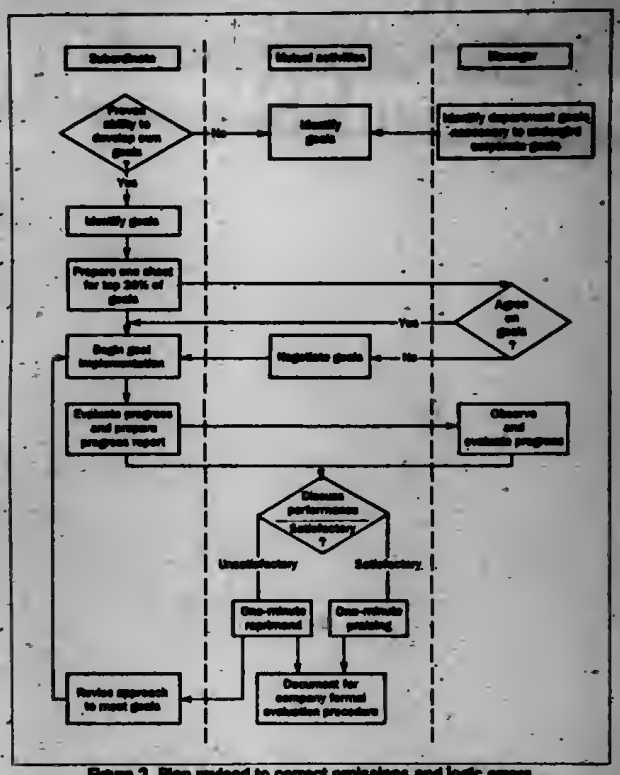

Figure 2. Plan revised to correct omissions and logic errors

4. Tell people how you feel about what they did wrong — and in no uncertain terms.

5. Stop for a few seconds of uncomfortable silence to let them feel how you feel.

The second half of the reprimand:

6. Shake hands, or touch them in a way that lets them know you are honestly on their side.

7. Remind them how much you value them.

8. Reaffirm that you think well of them, but not of their performance in this situation.

9. Realize that when the reprimand is over, it's over.

Why begin with the reprimand? The more common practice is to begin with something positive. "For some reason, it just doesn't work," says the One-Minute Manager. "If you are first tough on behavior and then supportive of the person, it works.

"Sometimes, you have to care enough to be rough. And I am. I am very tough on the poor performance — but only the performance. I am never tough on the person."

One-minute goal setting

I have held off repeating Blanchard and Johnson's procedure for one-minute goal setting because of its weaknesses. The process is as follows:

1. Agree on your goals.
2. See what good behavior looks like.

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3. Write out each of your goals on a single sheet of paper using less than 250 words.

4. Read and reread each goal, which requires only a minute or so each time you do it.

5. Take a minute every once in a while out of your day to look at your performance.

6. See whether your behavior matches your goal.

Figure 2 presents a much more realistic procedure for setting goals. However, I repeated the Blanchard/Johnson procedure because it provides their rationale for the expression "one-minute goal setting." The rationale is mighty weak! Reading and rereading goals for one-minute intervals — daily — would be a simplistic and unproductive activity for most managers. Much more beneficial is the approach of having each key goal so precisely and concisely stated that it can be read in one minute. Equally valuable is the reminder of the need for formal review of performance against goals — done by the individual frequently.

Relevance to DP managers

Few would dispute the applicability of the foregoing discussion to the DP manager. However, the degree of relevance takes on more meaning when viewed in the context of the Couger-Zawacki research on DP managers (*Motivational Management of Computer Personnel*, Wiley Interscience). One finding was that subordinates believe their managers provide insufficient feedback — at all levels. Feedback is rated significantly higher in other fields, based on a comparison with the Hackman/Oldman data base on managers in other fields (collected using the same survey instrument as in our research).

DP managers also believe that feedback from their superiors is inadequate. Apparently, in their efforts to stay current in a dynamic field, managers at all levels neglect feedback. The Blanchard/Johnson concept of timely but brief feedback is not only compatible with the DP environment, it is perfectly attuned to it.

According to Blanchard/Johnson, most managers are "gunnysack disciplinerrs." That is, "They store up observations of poor behavior . . . and dump everything on the table" at performance review time.

"In order to look good as a manager in most organizations, you have to catch some of your people doing things wrong. You have to have a few winners, a few losers and everyone else somewhere in the middle. You see, in this country, we have a normal distribution-curve mentality."

Frequent evaluations are much more effective and take a small amount of managerial time. The goal, according to one of the One-Minute Manager's subordinates, is "crystal-clear feedback."

Management training

Also apropos to DP management is the material on training of managers. The One-Minute Manager has a lot of turnover in his area, which might appear to be symptomatic of a managerial problem. However, the reason is his ability to prepare subordinates for management. "Whenever we have an opening and need a good manager," the personnel manager says, "we call him. He always has somebody who is ready."

When asked about this situation, the manager says, "It's ironic. Most companies spend 50% to 70% of their money on people's salaries. And yet they spend less than 1% of their budget to train their people. Most companies, in fact, spend more time and money on maintaining their buildings and equipment than they do on maintaining and developing people."

He observes, "You really have three choices as a manager. First, you can hire winners. They are hard to find, and they cost money. Or second, if you can't find a winner, you can hire someone with the potential to be a winner. Then you systematically train that person to become a winner. If you are not willing to do either of the first two, then there is only the third choice left — prayer."

Although it devotes just a few paragraphs to the subject, the book also discusses goal congruence/goal ambiguity. Its relevance to the DP community was confirmed by a nationwide study recently completed by Dr. Mel Colter and me, to be reported in a forthcoming book (*Handbook of Managerial Techniques for the Computer Field*, Couger and Zawacki, 1985).

The One-Minute Manager tells his interviewer, "In most organizations, when you ask people what they do and then ask their boss, all too often you get two different lists."

How do you avoid such a situation? Unfortunately, the answer is omitted from the game plan. It is explained in the text, however, and is shown in Figure 2. After goals are accepted, performance criteria are carefully identified — not only "attitudes or feelings" but also "what is happening in observable, measurable terms."

According to the One-Minute Manager, when inexperienced people don't perform, "rather than punish them, we need to go back to the one-minute goal setting and make sure they understand what is expected of them."

A good summary appears, strangely enough, midway through the book, on Page 62. The interviewer tells the One-Minute Manager, "I found out why you call yourself a One-Minute Manager. You set one-minute goals with your people to make sure they know what they are being held accountable for and what good performance looks like. You then try to catch them doing something right so you can give them a one-minute praising. And then, finally, if they have all the skills to do something right and they don't, you give them a one-minute reprimand."

The appeal and importance of the book to DP management is its message that effective feedback does not have to take a lot of time.

DP personnel have a proven ability to shortcut lengthy, technical processes to get to the heart of a matter. Shortcutting can be carried to the extreme, however. Such would be the case of the harried One-Second DP Manager who shakes a finger at a busy subordinate and says, "One-second reprimand" or gives the thumbs up sign and says, "One-second praising" — to which the subordinate responds with equal efficiency, "Acknowledged!"

About the author

J. Daniel Couger holds the title Distinguished Professor of Computer and Management Science at the University of Colorado, Colorado Springs. He has lectured in more than 50 countries and written 15 books and more than 60 papers.

Prior to his academic appointment, Couger served as a manager in the computer field. In 1977, he was named U.S. Computer Science Man of the Year.

SOFTWARE & SERVICES

ISO group forcing issue on Cobol-80

SOFTALK

PAUL GILLIN
CW Senior Editor

The recent decision by an International Standards Organization (ISO) working group to proceed on adopting a Cobol-80 standard before similar action has been taken by the American National Standards Institute should send a strong message to Ansi. The international community is becoming impatient with the slow progress that is being made toward Cobol-80 in this country.

But perhaps a more interesting sidelight to the Cobol activity in Vienna was the adoption of a proposal to change the current schedule for revamping Cobol. Under the terms of the proposal, new features would be added to the language every two years, and clarifications, or a complete overhaul, would take place every 10 years. Currently, Cobol comes up for modification every five years, although the 10-year lag between the Cobol-74 standard and the latest proposed revision indicates that that rule is symbolic at best.

The new proposal, which was submitted by Cobol-80 advocate Jerome Garfunkel, will no doubt be extremely controversial and may never see the light of day after it leaves the ISO working group. Garfunkel himself has come under stringent criticism for downplaying issues of upward compatibility in favor of adding power to the language. However, his proposal is an interesting one.

A fundamental argument is emerging

See COBOL page 58

Consider complete security aid

By Dennie Speeste
Special to CW

For data centers that use both batch and on-line facilities, a security administrator's evaluation won't be complete before he considers a comprehensive security package designed to meet the security requirements of both batch and on-line.

Proponents of multiple security systems argue that separate security packages are necessary for IBM's TSO and CICS because they are different systems which have different rules, or "user profiles," and may even have their own dedicated terminals.

IBM's TSO, CICS, IMS and batch all recognize the standard security interface in the IBM MVS operating system and will use this interface when directed to do so. The security package that uses this interface when reacting to security supervisor calls will comprehensively protect resources. When a security verification request is made by any facility, only one security data base is used.

Furthermore, the security information for a particular user is known by the security package, regardless of the facility originating the request. When the security package is designed with a "user-to-resource" logical structure, this verification can be done with a single I/O operation.

Hooking directly into the MVS security interfaces also means that modifications will not have to be made to the operating system. Therefore, a single security maintenance procedure can update both batch and on-line, making the security package easier to maintain.

A total security package affords ease of use by providing centralized administration in place of independent jurisdiction over batch and on-line uses of a file. This means when a user is on-line (TSO, CICS) or identified in a batch region, all the resources allowed to that user are known to the security product. This allows security to be centrally controlled by one security administrator. If a security administrator is required for each facility, difficulties may arise as a result of each working independently and then trying to coordinate what they've done. With a comprehensive security software product, you don't distribute the responsibility or compound your headaches.

For auditors who need multiple reports, a comprehensive security package displays any user's violations in one place, a convenience that is tremendously appreciated.

There are obvious benefits of using a single security package for all transactions. It's easier to evaluate and purchase one package and probably less expensive to deal with a single vendor. From the installation and maintenance point of view, one package produces one set of reports, one data base and one set of rules to learn. For auditors who need multiple reports, a comprehensive security package displays any user's violations in one place, a convenience that is tremendously appreciated. These benefits save a great deal of time and effort. Why use two security products which would mean twice the work and training?

A security package for "CICS-only" will only secure certain resources while CICS is running and only when these resources are accessed through CICS. So when CICS is down, so is your security. When CICS is

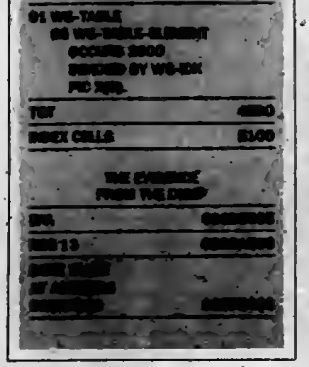
See SECURE page 54

INSIDE

SOFTLINE/JOHN L. MINDOCK

Solving the riddle: interpreting indexes in a Cobol dump

Do you avoid using indexes in your Cobol programs because you are not sure how to interpret them in a dump? I, Watson, will relate a tale of the great programmer, Holmes, caught in just such a dilemma. First, the evidence:



And now, the narrative:

"It is the 12th occurrence," stated Holmes in his usual unemotional manner.

Only a few scraps

"You have only a few scraps of a program and a partial dump, yet you are able to decide which occurrence of the table is being referenced by the index?," I questioned.

"The TGT [task global table] was the major piece of evidence," he said. "As you can see, it begins at a displacement of X'4EDO' into the program. Also, the beginning of the fields known as 'index cells' is at a displacement of X'5100' into the program," the great programmer stated.

"I see the EPA [entry-point address] of the program is X'000B6C68,'" I retorted. "If I add the displacement of the index cells to that, I calculate that the index cells begin at core address X'000BAD68,' but located at that address is the full-word [four bytes] X'00000058,' which hardly suggests occurrence 12 to me."

Usual sticky point

"That is the usual sticky point for debuggers, but the translation from the core value to the occurrence number is quite straightforward.

X'0000058' equals '88' in base 10, which suggests that we are interested in the occurrence that begins at the 88th byte past the table's first byte," he advised.

"Since the occurrences are each 8 bytes long," he continued, "and the first occurrence begins at the 'OTH' byte past the beginning of the table and the second occurrence begins at the eighth byte past the beginning of the table, it follows that the 12th occurrence begins at the 88th byte past the beginning of the table."

"One could say," I offered, "the hexadecimal value found in the full-word index cell is added to the address of the beginning of the table to calculate the address of the occurrence being referenced."

"Quite — but it takes some translation to decide which occurrence that really is," he continued. "A formula could be devised:

O = V/L + 1, where
O = occurrence,
V = value of the full, word in base 10 and
L = the length of each occurrence.

In our case, O = 88/8 + 1 = 12," he added.

"It seems you had extra information — the beginning address of the TGT and the value of register 13, for example," I injected.

Verifying results

"This further served to verify my results. Register 13 usually contains the beginning address of the TGT," he replied. "So by adding the contents of register 13 to the offset of the index cells into the TGT, I arrived at the same address for the index cells. X'000BAB36' + (X'5100' - X'4EDO') = X'000BAD68,'" he explained.

"If there were more than one index in the program, I surmise that their values would appear in successive full words following the first index cell's full word, in order as they were defined," I stated somewhat smugly.

"Elementary, my dear Watson."

Mindock is a senior programmer/analyst at Rosemount, Inc., which is located in Eden Prairie, Minn. He is no relation to Sir Arthur Conan Doyle.

Seeking upgrades, user turns to the source

DALLAS — HCB Contractors, one of the nation's major construction contractors, faced an increasingly common dilemma a year ago. The backlog of requests for on-line applications was much greater than the staff of six programmers could handle. And new requests were being added at an increasing rate.

"We've gone from [an IBM] System/34 to a 4341 Model Group 1 in three years," Ed Faulkner, HCB's MIS director, said. "Our people were turning out one on-line program for each seven man-days and losing ground against the demand."

HCB installed an application development system called Magec from Al Lee & Associates, Inc. here a year ago. "We've since implemented over 650 new on-line functions, and our backlog is now often expressed in weeks rather than years," Faulkner said.

"But that opened up the door for some new problems that we hardly had to be concerned with last year — security," according to Faulkner.

Security essential

With an HCB project valued at millions of dollars, a high level of security is essential, Faulkner said. Magec includes a built-in security system for generated applications. "But it became increasingly obvious that we were going to need more," he noted. "With the number of applications and terminals we have and anticipate having, our vulnerability has increased."

HCB's network includes a variety of IBM 3270 local, remote and dial-in devices and Motorola, Inc. microcomputers.

Sensitive information carried on the network includes job cost, estimates and payroll data. HCB has recently put much of the general ledger data on-line with Magec, with the off-line processing handled by a McCormack & Dodge Corp. general ledger package that is front-ended through Magec.

HCB considered purchasing a separate security system, but found that no package fit well into its environment, Faulkner said.

"We use the Datacom/DB [data base management system] from [Applied Data Research, Inc. (ADR)], which we are pleased with and which Magec handles well. We are also using ADR's Datacom/DC teleprocessing monitor, but have been considering switching to [IBM's] CICS," he said.

"We verified that all our Magec-generated applications, and Magec itself, will transfer to CICS without any program changes; therefore, whichever security system we used would have to do the same," according to Faulkner.

Faulkner contacted Al Lee Associates and arranged for the security enhancements to be made. All of the changes were made to Magec, and HCB is now using the updated product.

Changes to Magec

Among the changes to Magec were:

- *Addition of real-time maintenance.* The system allows the security officer to "deactivate" terminals, operators or on-line functions immediately if needed, Faulkner said.
- *Dial-in support.* The system handles line disconnects and other anomalies of dial-in networks in addition to the usual problems with dedicated lines and locals.
- *Low overhead.* The security system does not interfere with the ability to handle high-transaction volumes.
- *Passwords.* Operator passwords can be periodically changed, and the system forces changes at specified intervals.
- *Group identification.* It is possible to identify all operators belonging to a specified group in order to deactivate them as business needs change, Faulkner noted.
- *Automatic logoff.* The system automatically logs off an operator who forgot to do so and deactivates an operator after a threshold number of inactive days, upon termination date or after a specified number of failed logon attempts.
- *Time and day.* The system supports specifications of a range of hours and days of the week during which a terminal or operator is allowed access.
- *Fine control.* It controls accesses at a finer level, down to what function could be done to what data.

"When you can sit down and discuss your idea of the 'perfect' system with a software vendor and then have him actually incorporate almost 100% of your input plus add some features you hadn't thought of, you can't help but be pleased," Faulkner said.

'Video games . . . video games . . .'

Backup system upgraded to fit DEC's RSTS/E

ANAHEIM, Calif. — Data Processing Design, Inc. has announced an upgrade to its Saver Disc Backup System to support the latest versions of Digital Equipment Corp.'s RSTS/E operating system. The package is said to provide a 100-fold increase in file efficiency by file reorganization.

According to the vendor, the upgraded Version 2.7 takes advantage of new features of RSTS/E to organize the disk for faster file access.

Saver 2.7 supports Versions 7.2 and 8.0 of RSTS/E. The price is $860.

Data Processing Design is located at 1400 N. Brasher, Anaheim, Calif. 92807.

SYSTEMS SOFTWARE

D.A. BRASK SYSTEMS, INC. CICS/TSO

D.A. Brask Systems, Inc. has introduced software support for IBM CICS transaction processing to IBM's TSO teleprocessing monitor.

CICS/TSO reportedly provides an alternative to running one or more test CICS systems, the vendor said. The package is said to give programmers immediate access to test regions that are isolated from other applications.

The software is implemented as a TSO command that creates a single-terminal CICS system within the TSO region. CICS transactions can then be processed, with CICS/TSO providing the terminal-control interface between CICS and TSO. An End command is used to switch back to the TSO environment, the vendor said.

CICS/TSO is designed for use in the IBM MVS environment and supports CICS Version 1.5.

The package is available now on a free, trial basis. A first-year license fee costs $3,000, and the annual renewal is 20% of the license fee, the vendor said.

D.A. Brask Systems, 4805 Pershing Road, Downers Grove, Ill. 60515.

PRECISION BUSINESS SYSTEMS Spy; Photo; Advisor; Access; Version 2.0 TMX-32; DMF/Driver; DV/Driver

Precision Business Systems (PBS) has announced a series of software systems for Digital Equipment Corp.'s line of VAX-11 processors running under the VMS operating system.

Three of the PBS packages are aimed at monitoring and controlling terminal usage. The Spy system is said to allow a privileged user to watch another user's terminal with or without the user's knowledge. The Photo system reportedly records and plays back a user's terminal sessions. The Advisor system is said to allow a user to redirect his keyboard so that commands and programs executed from a privileged user's terminal are executed in the context of another user.

PBS's Access system is said to be a system management security pro-

Continued on page 48

Tool fits mini, mainframe, micro systems

BATON ROUGE, La. — Communications Research Group, Inc. has announced Blast (Blocked Asynchronous Transmission), an asynchronous communications package that is available for more than 60 minicomputer, mainframe and microcomputer systems.

The package reportedly provides throughput, efficiency and error-immunity similar to synchronous communication through Blast's "sliding window" protocol. It uses a Synchronous Data Link Control-like, full-duplex sliding window Cyclic Redundancy Check (CRC) protocol, and binary or text files are transmitted as 8-bit-wide data.

Blast reportedly operates over standard dial-up telephone lines with asynchronous modems at any modem speed or over direct connections at speeds up to 19.2K bit/sec.

Blast uses a CRC algorithm to detect errors as they occur and requests retransmission of corrupted data, and data transfer, if interrupted, continues from the point of line loss, the vendor said.

The package is said to be available for a wide range of micro, mini and mainframe systems, including Data General Corp. processors under any operating system; Digital Equipment Corp.'s VAX-11, PDP-11 and Rainbow models; Hewlett-Packard Co.'s HP 3000, HP 125 and HP 150 systems; and IBM's mainframes and Personal Computer.

Blast is also available for Apple Computer, Inc. processors, Wang Laboratories, Inc. systems and Texas Instruments, Inc. and Vector Graphic, Inc. systems.

The IBM mainframe version of Blast for either the MVS/TSO or VM/CMS operating system is priced at $2,495; minicomputer versions are priced between $495 and $1,295; and microcomputer versions are priced at $250.

Communications Research Group is located at 6990 Jefferson Highway, Baton Rouge, La. 70809.

SOFTWARE & SERVICES

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gram for VMS. Access reportedly allows the system manager to limit access to a select group of programs and commands on a user-by-user basis. It also produces reports of each user's activities.

PBS also announced Version 2.0 of its TMX-32 Transaction Management Executive system, which the vendor said supports IBM CICS-like functions for applications where system availability and recoverability are required.

PBS also announced two device drivers that implement a variety of Binary Synchronous Communications (BSC) protocols under VMS. Both DMF/Driver and DV/Driver are said to be table-driven to support IBM's 2780, 3780 and 3270 primary and tributary protocols, as well as custom, BSC protocols.

The Spy, Photo and Advisor systems are priced at $1,500; Access is priced at $3,600, and Version 2.0 of TMX-32 is priced at $30,000. Object-code-only licenses for DMF/Driver and DV/Driver are priced at $9,000, and full source-code licenses for the two device drivers are priced at $27,000.

Precision Business Systems, 33 Rector St., New York, N.Y. 10006.

CENTURY ANALYSIS, INC.
List/8

Century Analysis, Inc. (CAI) has announced List/8, an end-user list management system designed to allow workstation users of NCR Corp. mainframes to input, manage, display and print data.

List/8, according to the vendor, can be used with CAI's Boss/3 and Impact/6 teleprocessing monitors on NCR's 8400, 8500 and 8600 series mainframes. The system is said to simplify the entry, maintenance and printing of information.

The List/8 system is also said to feature a simplified menu structure and screen prompts, and users can create their own entry screens appropriate to their data format. Data can be extracted by field name from one file into a new file, sorted into any sequence by specifying the field name, selected based on field contents and selected by exact match or by matching range of values.

List/8 is priced at $2,000.

CAI, 114 Center Ave., Pacheco, Calif. 94553.

TRIANGLE SOFTWARE CO.
Netcheck

Triangle Software Co. has announced Netcheck, a system management facility for IBM's DOS and OS operating systems that includes IBM's CICS/VS Version 1.5 and above.

The vendor said Netcheck solves the problem of CICS network control and allows a network operator to control and identify the status of any resource in the network. Netcheck reports when there is a resource failure anywhere in the network; creates an on-line data base on all resources, such as terminals, control units and lines; and allows the network to be dynamically organized and controlled.

The system is also said to eliminate the four-digit identification code restriction of CICS by allowing up to 20 characters. The on-line data base created by Netcheck is said to provide profiles on all resources and groups, including the CICS terminal identification, the specific location of the resource and the IBM Vtam node name.

Netcheck is priced at $8,500 for DOS/VSE and $12,500 for OS/VS.

Triangle Software, Suite 108, 4340 Stevens Creek Blvd., San Jose, Calif. 95129.

DATA 21, INC.
Release 2.0 Remote Print Facility-Extended

Data 21, Inc. has announced Release 2.0 of its Remote Print Facility-Extended, an IBM CICS spooling and teleprinting package.

Operating under CICS or IBM batch with IBM Power/VSE or Software Pursuit, Inc.'s Sage spooling systems, the release reportedly provides for print and display of IBM VM files on CICS terminals and printers.

It allows the printers to be shared by IBM CMS and CICS users without detaching and attaching devices, while providing printer scheduling and control of print tasks through a centralized system, according to the company.

It is available now. A permanent license is priced at $4,200.

Data 21, Suite 300-5, 3868 Carson St., Torrance, Calif. 90503.

AUBUCHON & ASSOCIATES, INC.
IBM Series/1 utilities

Aubuchon & Associates, Inc. (AAI) has announced a set of utilities for IBM's Series/1 computer.

The S/1 Machine Language Disassembler functions by disassembling memory in a specified partition and dumping memory in that partition. The vendor said this can be done in hexadecimal or Ebcdic and logged to devices such as printers and terminals or to files located on either disk or diskette.

AAI's UTDSK1 full disk handler utility is said to allow a user to handle all file management functions such as allocation and deletion of single and generic files. It also provides the user with volume management features such as define target or source, list volumes, initialize, rename volumes and list space on volume.

AAI also announced the EDL session manager editor, which the vendor described as a source formatter that will list formatted source to any terminal or printer. It also features the ability to write formatted source to a defined data set and restart formatting from a write failure.

AAI's $Monitor utility is said to provide the capability to display a common menu on all controlled CRTs. The system provides control of terminals by start and stop commands, and built-in functions allow a user to stop any program or terminal.

In addition, AAI announced Utility Job Running, which allows a user to display the time of system backup on the main menu. After the backup, all terminals are automatically started by the utility, and the main menu is displayed ready for the next day's work.

The AAI utilities are priced between $250 and $1,000.

AAI, Suite E, 5533 Red Bridge Road, Kansas City, Mo. 64137.

SIMWARE, INC.
Sim/Passthru

Simware, Inc. has announced a package designed to allow intercomputer communications among IBM mainframes using IBM's MVS and VM operating systems.

Sim/Passthru is intended for use by large installations, in particular those with two or more mainframes, the vendor said. It is designed to allow users with IBM 3270 terminals on MVS to access the central processor of the VM system and terminals on the VM system to access the MVS system without extensive hardware and software changes.

It is said to provide a direct link between the systems through a binary synchronous line of communication and to support 64 terminals with a single binary synchronous line or more terminals with multiple lines.

Sim/Passthru is leased for $7,500 per year.

Simware, 969 Bronson Ave. Ottawa, Ont., Canada K1S 4G8.

VM SYSTEMS GROUP, INC.
V/Force

VM Systems Group, Inc. has introduced V/Force, a software product that is said to solve the problem of the "hung-up" user or virtual machine for the system product installation.

A user can be hung up because the end of an I/O operation is not signaled correctly, a frequent occurrence with tape drives, the vendor said. When that happens, the user becomes stuck, and other users may also be unable to work. V/Force removes the problem user's operation from the system, allowing normal system operation to continue, the vendor said.

V/Force is priced at $2,050 per year.

VM Systems Group, 3123 N. Military Road, Arlington, Va. 22207.

AVP SYSTEMS, INC.
Verazip System

AVP Systems, Inc. has announced the Verazip System, which is described as a Zip Code verification system for use with IBM's Vsam and Isam or any Ansi Cobol-74-compatible software.

The Verazip System reportedly allows the user to validate Zip Codes on files or on input transactions. It consists of a data base of all valid Zip Codes in the U.S. and a series of programs that are used to access the file, edit the data and print or display the results. Programs are also included to maintain the Zip Code file and to provide on-line capabilities.

The Verazip System leases for $1,900 the first year and $950 for each subsequent year, according to the vendor.

AVP Systems, 237 Washington St., Marblehead, Mass. 01945.

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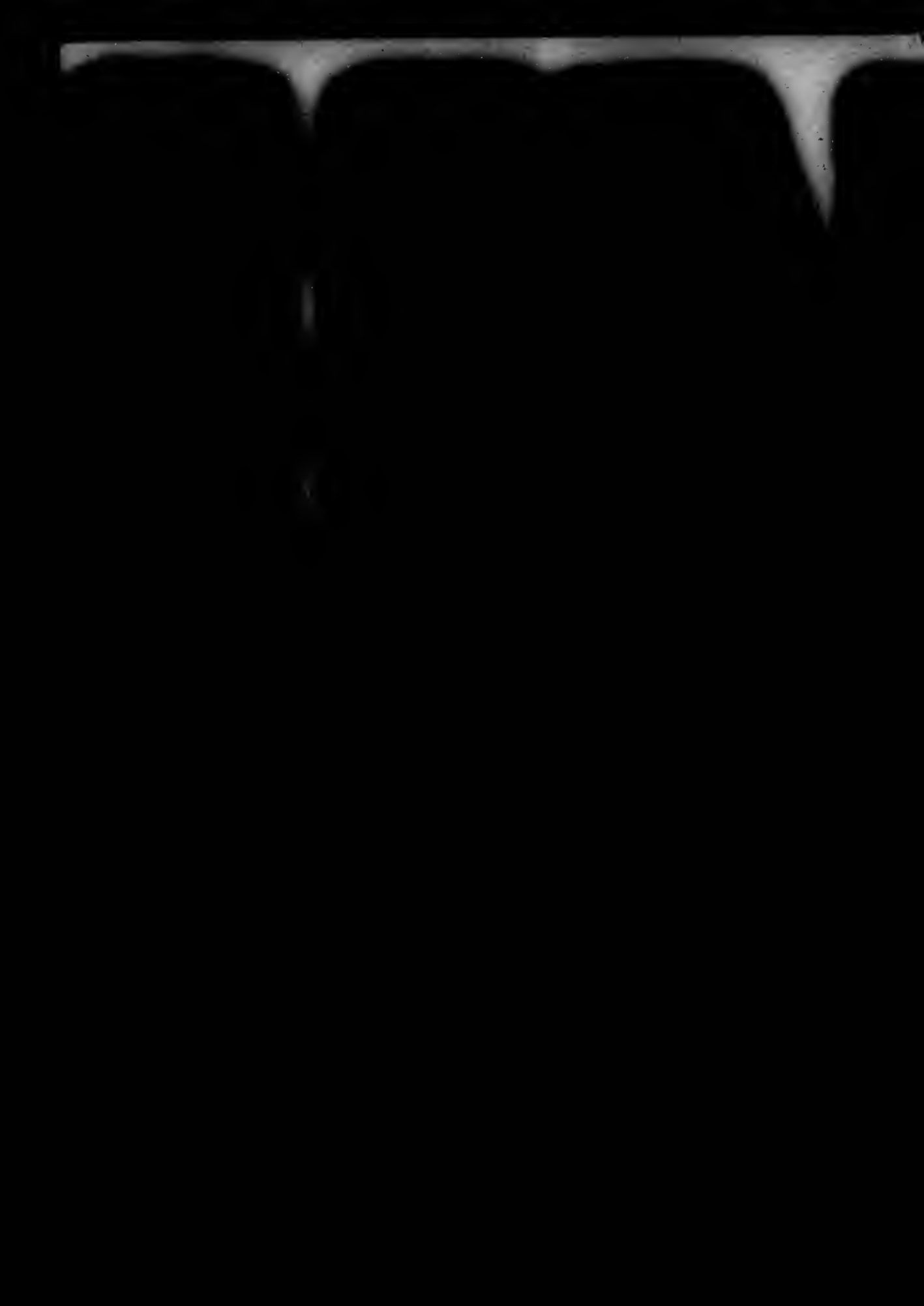

SOFTWARE & SERVICES

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COMPUTER NETWORKS, INC.
Honeylink

Computer Networks, Inc. has announced Honeylink, a Honeywell, Inc. VIP 7800 series terminal emulator for the IBM Personal Computer.

According to a spokesman, Honeylink combines hardware and software to provide the user with an emulator for either synchronous or asynchronous communications. It is said to be fully compatible with the full series of Honeywell 7800 video display terminals.

Honeylink reportedly provides standard terminal features, such as 72-line scroll, a buffered printer adapter and file transfer capabilities to transfer data between the Personal Computer and the Honeywell host computer. It is priced at $995.

Computer Networks, Suite 220, Building 6, 799 Roosevelt Road, Glen Ellyn, Ill. 60137.

PRODUCTIVITY AIDS

AMER-CAL, INC.
Productivity Tools

Amer-Cal, Inc. has announced three productivity tools for users of Cincom Systems, Inc.'s Mantis applications development system.

The Mantis Batch Submit (MBS) facility for IBM's DOS/VS and DOS/VSE operating systems is said to allow a Mantis program to submit jobs to the IBM Power reader queue. The JCL is defined in a Mantis interface which is created by the MBS facility, and information such as date cards or other parameters may be passed to insert into the JCL at execution time.

The Mantis Subroutine Library (MSL) is said to be designed to provide those structures commonly used in business, such as add, change, delete, display and browse, along with common subroutines needed to support those structures.

The Enhanced Mantis Security (EMS) is said to be a generic security system that provides Mantis security at the program function key level. The package is said to be resource efficient, and it allows for consistency and auditability.

MBS is priced at $2,000 or leased for $100 monthly; MSL is priced at $7,500 or leased for $375 monthly; and EMS is priced at $5,000 or leased for $250 monthly.

Amer-Cal, 115 E. University Drive, Arlington Heights, Ill. 60004.

MVC ASSOCIATES, INC.
Ramis II Reporting

MVC Associates, Inc. has announced Ramis II Reporting, which the vendor described as an addition to its interactive computer-based training library.

The system is said to utilize full screen simulation techniques to provide the student with education in the use of Mathematica Products Group's s Ramis II fourth-generation programming language. The course is compatible with IBM's Interactive Instructional System and Goal Systems International, Inc.'s Phoenix, according to the vendor.

Ramis II Reporting is interactive and self-instructional, and the simulation techniques are used to support the tutorial.

Ramis II Reporting can be purchased for $5,500 or leased at $250 per month.

MVC Associates, 849 N. Summit Ave., Lake Forest, Ill. 60045.

APPLICATION PACKAGES

ENHANCEMENT SOFTWARE CO.
Vsecalc

Enhancement Software Co. has announced an electronic spreadsheet system for IBM mainframes operating under IBM's DOS/VSE operating system.

The package reportedly provides three separate methods of creating and accessing spreadsheets: through CRTs, from user-written programs via subroutines or through batch.

The Vsecalc spreadsheet contains 64 columns and 512 rows. Cells may contain either string or numeric data or formulas that are used to calculate the value of the cell by using the values in other cells on the spreadsheet, the vendor said.

Other features reportedly provide variable column widths and attributes, random-number generation, table lookups, sorting, true/false logic, spanning of string values over column boundaries, spreadsheet merging, moving, copying and replicating of cells and cell protection.

The package is available now and is priced from $3,500.

Enhancement Software, P.O. Box 6276, High Point, N.C. 27262.

OUTLOOK SOFTWARE, INC.
Version II of Outlook/36

Outlook Software, Inc. has announced Version II of its Outlook/36 financial modeling package for the IBM System/36.

A spokesman said Version II provides more than 50 enhancements and features, including 22 predefined financial and statistical functions giving the package a total of 53 such functions.

The added functions include internal rate of return, linear regression, accelerated depreciation, least-squares forecasting, amortized repayment of principal, amortized principal amount, weighted average, correlation analysis, covariance and ranking.

The spokesman said calculations

SOFTWARE & SERVICES

can now be specified down to the element or cell level, both for model-level calculations and consolidation calculations, according to a spokesman for the vendor.

Version II of Outlook/38 is priced at $3,450.

Outlook Software, Suite 117, 1 Woodfield Lake, Schaumburg, Ill. 60195.

SHAWWARE, INC.
Stores System

Shawware, Inc. has announced the Stores Inventory and Purchasing Management System for the IBM System/34, System/36 and System/38 processors.

According to a spokesman, the Stores System comprises three modules that can be purchased separately or as an integrated system.

The purchasing management module automatically generates purchase orders and provides on-line inquiry into both the status of outstanding purchase orders and vendor performance levels.

The inventory management module provides maintenance of on-hand balances in both dollars and quantity for all products by warehouse location. The system generates suggested reorder reports. The accounts payable system provides audit controls while allowing flexibility in entering transactions, a spokesman said. The system also automatically produces and reconciles checks.

The complete Stores System is priced at $20,400 for the System/34, $25,200 for the System/36 and $28,000 for the System/38.

Shawware, 3405 Harvester Road, Burlington, Ontario, Canada L7N 3N1.

MANUFACTURING SOFTWARE SYSTEMS, INC.
MRP II Software Audits

Manufacturing Software Systems, Inc. has introduced MRP II Software Audits, an evaluation service for companies purchasing manufacturing resource planning software.

The company reviews any software package or in-house application. The service reduces evaluation time from nine to 12 months to two to three months and finds problems that companies often overlook, the vendor claimed. The reports do not recommend any package, but state facts and allow the buyer to draw his own conclusions.

The service costs $1,200/day plus expenses.

Manufacturing Software Systems, 85 Allen Martin Drive, Essex Junction, Vt. 05452.

UNILOGIC LTD.
Scribe for Unix version

Unilogic Ltd. recently announced that a version of its Scribe package for drafting, formatting and printing documents, is now available for use under the University of California at Berkeley's 4.2 Unix running on the Digital Equipment Corp. VAX-11 series.

Scribe is used to produce reports, technical manuals, proposals and similar documents and is reportedly able to print on a wide range of output devices.

The version for 4.2 Unix is provided free to all Scribe maintenance customers licensed as VAX/Unix sites. The product is available for a one-time license fee of $25,000, and maintenance fees are $200 per month.

Unilogic, 160 N. Craig St., Pittsburgh, Pa. 15213.

MCBA, INC.
P/O

MCBA, Inc. has introduced a purchase order package written in Cobol for Wang Laboratories, Inc.'s VS family of minicomputers.

The Purchase Order and Receiving (P/O) package reportedly can create and maintain purchasing records. It is capable of predicting cash requirements, monitoring vendor performance and preventing shortages of needed material, the vendor said.

P/O is said to permit on-line entry and editing of purchasing data, printing of purchase orders, correcting of purchase orders and cancellations. It also supports blanket purchase orders and drop-ship purchase orders, the vendor said.

A source code license ranges from $3,000 to $9,000 depending on the VS model.

MCBA, 2441 Honolulu Ave., Montrose, Calif. 91020.

SATCOM COMPUTING, INC.
QMS

Satcom Computing, Inc. has introduced a quality and manufacturing system, QMS, that operates on Hewlett-Packard Co. HP 3000 series computers. Written in Cobol, it uses Hewlett-Packard's Image data base management system.

QMS is parameter driven and consists of four integrated subsystems which span eight data bases. Modules include quality and specifications, materials, order processing and production management reporting, according to the vendor.

The license fee for the four mod-

Continued on page 84

SOFTWARE & SERVICES

Continued from page 83

ules is $135,000, which includes documentation, and a one-year product warranty.

Satcom Computing, 4530 Professional Circle, Virginia Beach, Va. 23455.

ROBERT ROUTMAN & ASSOCIATES
Impact 34/36

Robert Routman & Associates has announced Impact 34/36, a wholesale distributor software system for IBM System/34 and System/36 computers.

The package is designed to help wholesale distributors control their daily operations, the vendor said. It covers functions including order entry, pricing flexibility, invoicing, back orders, drop shipments and special orders, accounts receivable, purchasing, inventory control and manufacturer's programs.

The system also includes payroll, inside telephone salesmen's and outside salesmen's commissions, sales analysis programs, warehouse production, truck routes and catalog programs, the vendor said.

Impact 34/36 is available for a one-time license fee of $34,500, according to the vendor.

Robert Routman & Associates, 17 Colonial Drive, Youngstown, Ohio 44505.

DATA BASE MANAGEMENT SERVICES

PRIME COMPUTER, INC.
Prisam; Discover

Prime Computer, Inc. has announced a data base management product and an enhanced version of its data base management system (DBMS) Query and Report Writer for use in commercial environments with high-volume transaction processing.

Primes access method, Prisam, reportedly combines an Isam data model with automatic recovery. Concurrent data access control and automatic recovery are provided through Prime's Roam, allowing for system halts, media failure and software error, according to the company.

Discover is an enhanced version of the DBMS Query and Report Writer. It is said to update Prisam files and handle ad hoc queries and reports.

Prisam and Discover run on Prime 50 series, 32-bit superminicomputers. Prisam will be available March 10, and Discover will be available May 15.

Prisam is priced at $6,000. Discover is priced at $4,000 with Prisam support and at $10,000 with Prisam and Prime's DBMS.

Prime Computer, Prime Park, Natick, Mass. 01760

LANGUAGES

CRWTH COMPUTER COURSEWARES
Using Ramis II

Crwth Computer Coursewares has introduced "Using Ramis II," a computer-based training (CBT) course for Mathematica Products Group, Inc.'s Ramis II fourth-generation programming language.

The course runs on CBT presentation systems such as IBM's Interactive Instructional System, Goal Systems International, Inc.'s Phoenix or Boeing Computer Service Co.'s Scholar/Teach 3. It can run on IBM's TSO and CMS or any other operating system for IBM mainframe computers.

"Using Ramis II" can be leased for $3,750/year or purchased for $7,500. The license includes all new releases at no extra charge.

Crwth Computer Coursewares, Suite 200, 619 Wilshire Blvd., Santa Monica, Calif. 90401.

SECURE from page 45

up, the possibility of accessing protected resources through batch or TSO still exists.

Your goal is dependable security for all the facilities in your data center. A single comprehensive security package satisfies that goal and is easier than multiple products to evaluate, learn and use.

And it provides an extra bonus: satisfied users.

Sposato is a senior security consultant with CGA Software Products Division, located in Marlboro, N.J. 07746.


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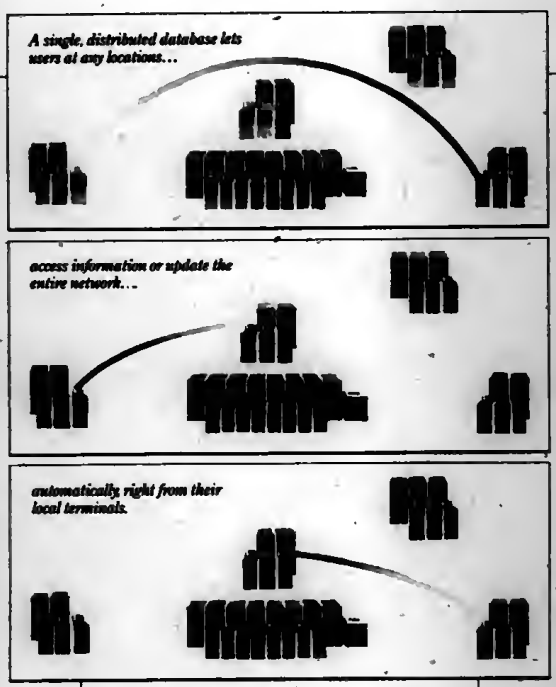
The Tandem NonStop Network eliminates information float.



Information float. It's when your sales manager in Phoenix needs accurate inventory information from the warehouse in Atlanta—and at the exact same time a salesman at the Seattle office is asking for the product. Or when your plant foreman in Boise needs clarification on product specs from the engineering manager at the lab in Boston. When *any* of your people, in short, has an immediate need for timely, up-to-the-second information from people at other locations—and can't get it. That's information float.

Tandem's NonStop network solves the problem.

A NETWORK OF NETWORKS

With a Tandem information system, it doesn't matter where you're sitting—you've got complete and instantaneous access to the information you need—regardless of whether it's across town, or clear on the other side of the world.

The reason is simple. Each Tandem NonStop computer system has been designed from the ground up as a total information/communications system. Which means that each system is actually a self-contained network. A network that encompasses interprocessor communications in a single system at one physical location, and extends all the way to a 255-system configuration spread across the globe.

Phoenix/ Sales

By putting the most often used data on the local system, you get faster response time and lower communications costs.

way you work.

This approach to system design conforms to the way information is actually used and communicated throughout an organization—at different times by many people in various locations and at different levels of responsibility. That means that you can place the information you deal with most on your local system, giving you better response times for your users, lower communication costs, and independence from any problems that might occur at other points in the network.

In addition, because each location needs different *kinds* of information, the Tandem system lets you determine up front which departments can access what kinds of data. The result is that network-wide data is always available for corporate-level reporting and management, while the appropriate local data is available for managerial decision-making at each department, office or facility.

Tandem systems can be linked to other mainframes or networks (including SNA); a state-of-the-art fiber optics system for connecting hundreds of processors within your headquarters or plant; a

satellite link (in conjunction with American Satellite Company) for connecting widely dispersed offices; and an advanced-communications package, called TRANSFER,™ to manage it all.

Plenty of room to grow. And change.

Tandem's modular approach to hardware design gives you a simple, ongoing, "building block" procedure for system expansion or rearrangement. You don't have to know up front exactly what your configuration will be. Or how—and when—it might change again. The result is that your original investment in equipment and program is always protected.

THE KEY IS A SINGLE, DISTRIBUTED DATABASE

Tandem's unique ENCOMPASS™ DBMS actually distributes a single, unified database across the entire network, providing your users with two important advantages: first, no matter where they are on the network, they can access data from anywhere else, without having to know where the data is located.

And second, by simply entering information at their local terminal, your users are instantaneously updating every single node in the system—automatically.

Boise/ Production

Relating data to information.

The key to manipulating data in such a simple, straight-forward manner is Tandem's high-performance relational database. Because setting up files merely involves creating or filling in tables with data records, no device-dependent "pointers" are used to maintain relationships, making the database extremely easy to use.

New files can be set up at any time, in any location—just by adding new tables or rows. This allows you to reconfigure your data files as needed, transferring the most often used files to the local node. So you can be continually fine-tuning your system, moving your data to where it makes the most sense, with no penalties in performance. In the proc you are reducing the float on inf tion by dramatically lowering user r nse time, as well as saving networ sources and increasing overall syste rformance.

Boston/ Engineering

WHEN YO NEED IT WITHOUT FAIL

From the CPU itself to our new satellite links, the entire system is maximized for completely fault-tolerant operation. If any component fails, the corresponding device or alternate data path automatically takes over and performs the function. And the defective unit can be repaired or replaced wit shutting down the

Chicago/ Corporate

At corporate headquarters, management has network-wide access to continuously updated information for operations and reporting.

The data protection solution.

On the software side, our ENCOMPASS database manager includes a special subset called the Transaction Monitoring Facility (TMF), which is devoted solely to ensuring network-wide data integrity and recoverability.

With TMF, the system maintains an audit trail of all transactions, protects files from access when the database is in an intermediate state, and provides complete backout and roll-forward recovery procedures if a transaction cannot be completed for any reason.

In addition, Tandem's GUARDIAN™ operating system complements the ENCOMPASS database manager to oversee all aspects of NonStop architecture, ensuring that all database linkages are consistent at each node of the network.

THE TANDEM SUPPORT NETWORK

Whether it's a two-processor system or a 255-system global network, the Tandem NonStop network is uniquely suited to the complete information requirements of multi-divisional, multi-national corporations.

Tandem provides local sales and service support around the world. Including fourteen software education centers in the U.S., Canada and Europe offering professional technical training courses for your programmers and analysts.

For more information on the Tandem NonStop computer network, mail in the postcard, contact Tandem at 800-482-6336, or call your local Tandem sales office.

Atlanta/ Warehouse

TANDEM

NonStop Transaction Processing

Tandem Computers Incorporated
19333 Vallco Parkway
Cupertino, California 95014

SOFTWARE & SERVICES

REMOTE COMPUTING SERVICES

FINEPORT COMPUTER SERVICES, INC.
Twilight Service

Fineport Computer Services, Inc. has announced the Twilight service, a time-sharing service for IBM's VM/CMS-based operating systems.

The Twilight service will operate weeknights from 7 p.m. to 7 a.m. and weekends from 7 p.m. Friday to 7 a.m. Monday.

It offers a choice of programming languages, including Cobol, PL/I, Basic and Fortran, along with other VM/CMS operating-system-based products.

Twilight service is priced at $10/hour, and access is reportedly provided at a dial-up rate of 300 to 1,200 bit/sec through Tymnet, Inc.'s Tymnet.

Fineport Computer Services, One Moody Street, Waltham, Mass. 02154.

ON-LINE DATA BASES

BUSINESS RESEARCH CORP.
Investext

Business Research Corp. has announced an on-line data base designed to provide financial data on 101 American and foreign computer and data processing companies.

Investext is said to contain more than 400 reports from 27 investment banking firms on the 101 companies, as well as almost 600 reports on the computer industry and related industries.

Investext can be accessed by personal computers and terminals supported by a 300 bit/sec or 1,200 bit/sec modem.

The price is $95/hour, plus the cost of telecommunications and $4.50 per 3,000-char. electronic page. A typical eight-page report costs about $40, according to the company.

Business Research, 1660 Soldiers Field Road, Boston, Mass. 02135.

INTERACTIVE DATA SERVICES, INC.
Institutional Bond Quote Service

Interactive Data Services, Inc. has announced a quotation service designed to provide daily institutional bond prices.

Institutional Bond Quote Service is said to provide daily lot price quotations at 7:30 p.m. EST for bonds listed on the New York and American Stock Exchanges and more than 10,000 over-the-counter bonds.

Quotations are available on magnetic tape or by direct transmission to mainframe-type computers. Quotations are also available on-line for time-sharing users of Interactive Data Corp.

Prices vary according to the frequency of use, ranging from $8,500 per year for monthly quotations to $26,000 annually for daily quotations. In addition, customized service is available for 25 cents per quotation.

Interactive Data Services, 22 Cortlandt St., New York, N.Y. 10007.

COBOL from page 45

over the continued viability of Cobol in an environment that is starved for productivity improvements. In the past few years, fourth-generation languages have proliferated to the point that application development tools are now offered by virtually every major systems software vendor. These products are now beginning to be used for production-scale applications.

The drawback is that most of these tools still generate specialized code in which programmers must be educated to be productive. As more and more applications are developed in high-level languages, the industry's large existing body of Cobol knowledge becomes less useful.

If Cobol can be modified on a regular schedule to incorporate more of these high-level capabilities, it can establish itself as an alternative to the new languages, Garfunkel believes.

He points to the fact that some vendors have chosen to take their own course and introduce compilers based upon the proposed Ansi standards before ratification. Thus the problem of proliferating versions of the language becomes even more acute. Frustration will build and incompatibility problems will only persist if the 10-year-plus lag in the addition of new features persists.

The Garfunkel resolution is intended to keep Cobol in step with the fourth-generation languages by enabling the standard to be upgraded with new capabilities on short notice.

However, the change also poses some serious hazards. Cobol is already hamstrung by the fact that some shops have never even converted from the 1968 standard. If a new version of the language emerges every two years, the stage will be set for an unprecedented spread of diverse compilers.

But is that incompatibility problem any worse than the one already presented by the multiplicity of high-level languages? If present trends continue, the industry will find itself in a situation in which one shop has Mathematica Products Group, Inc.'s Ramis, another uses Information Builders, Inc.'s Focus and another programs in Oxford Software Corp.'s UFO.

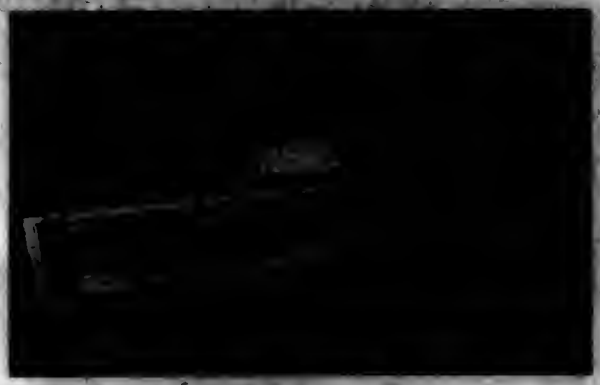
If Cobol can be made competitive with fourth-generation languages, it will at least provide an outlet for programmers who are already skilled in Cobol to take advantage of their knowledge.

Incredible as it seems, even Big Blue needs to be bailed out now and then. Personal computers are such a runaway success, they're running Information Managers ragged. The problem is personal computers and mainframes don't always work together.

The result is Computer Shock. And nothing short of a HERO™ can cure it.

HEROISM COMES TO PERSONAL COMPUTING.

HERO is the intelligent, desktop Networked Personal Computer from MDS®. It does everything a personal computer can do. And lots that it can't. But HERO's main fame derives from its interaction with the mainframe.



INTELLIGENCE AT EVERY STATION.

Mated with the MDS SUPER 21™ Communications Processor, HERO can converse intelligently in IBM networks. HERO emulates IBM 3270 SNA and the 3776 remote-job-entry systems. Our SUPER SNA™ option gives you both on one communications link. HERO runs software under MS-DOS. Plus its own multitasking operating system.

HEROS UNITE AND CONQUER.

With MDS HERO and SUPER 21, you can access private, departmental and corporate databases. Instead of not working, your entire organization can be networking. Under your control.

And only MDS offers you INTELLIGENT 3270.™ So you can write your own programs and integrate them with data in the mainframe. HERO lets you retrieve information from the database, process it, display it and update it. Then either return it or store it locally.

EVEN HEROS NEED ALLIES.

In addition to HEROS, SUPER 21 is available with non-intelligent workstations within INTELLIGENT 3270 networks. MDS offer the PLUS 80™ family of plug-compatible controllers, printers and displays. They're directly interchangeable with corresponding IBM 3270 units.

MDS HERO MAKES A HERO OUT OF YOU.

With HERO and SUPER 21, your existing data processing investments become part of an ever-expanding fund of available data. All of it coordinated, cost-efficient and controllable.

MDS systems are planned for non-obsolescence. They're modular in design to accommodate future growth. So every MDS system, like a hero, is immortal.

GET THE ADVANTAGES OF BIG WITHOUT BEING BLUE.

MDS is a multidivisional, multinational corporation. We've grown by helping our customers to grow. By focusing our size and scope on responsiveness to their needs. Not just in IBM country, but beyond.

We can do the same for you, wherever you are.

MDS offers service and support capability around the world, around the clock.

Ask our customers about us. And give us a call. Dial **800-MDS-HERO.** We'll show you how, when it comes to networking, MDS can help you unite and conquer.

MDS MOHAWK DATA SCIENCES

7 Century Drive, Parsippany, New Jersey 07054. And over 430 locations, worldwide.

HERO SAVES IBM!

WHEN IT COMES TO LINKING PC's TO MAINFRAMES, ONE COMPANY IS A MILLENNIUM AHEAD.

You don't have to look hard to see why McCormack & Dodge has linked more PC's to more mainframes than any other business software vendor.

It's a classic case of a superior product leading to superior sales.

To begin with, our link does more than just link. It works like you do. Selectively. Analytically. And in real time—so that company decision-makers always have the freshest, latest data available. Current and accurate up to the second you display it on your PC screen.

If you've tried out other PC links, you'll notice the M&D difference the moment you start downloading information from the mainframe to your desk. For example, you'll see that you can access all applications, no matter who designed them—not just those designed by McCormack & Dodge. And you'll discover the ease of working with a system that lets you pinpoint and selectively summon exactly the portion of data you need.

Once you've called the data down to your PC, the Lotus 1-2-3 software in our link lets you crunch numbers backwards, forwards, up and down—anywhere your mind wants to take them. You can instantly construct detailed spreadsheets. You create brilliant color graphs.

And the moment you finish massaging the data to your liking, our link lets you shoot it back to the mainframe (assuming you have the proper security clearance). You do it yourself on the spot—in real time. Without keyboard operators or programmers. So the entire company has the benefit of the latest information immediately. Not days later.

The M&D PC link is one of several products in our highly acclaimed Millennium family of borderless business software. When you compare the entire Millennium concept to anything else claiming "total integration," you'll see that M&D isn't just out-linking the competition. We're out-thinking them.

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COMMUNICATIONS

Sidestepping Centrex charges?

DATA STREAM

JOHN DIX
CW Senior Editor

Early this month, the Federal Communications Commission confirmed an earlier ruling on Centrex access charges [CW, Feb. 13]. Beginning on April 2, Centrex customers will pay an access fee of $2/line per month for lines in place before July 27, 1983 and a $6 fee for lines installed thereafter.

Centrex is a communications service provided by many telephone companies that provides users with features similar to, but more limited than, the telecommunications features of a private branch exchange (PBX).

The companies that offer Centrex services are rightly afraid the new access charges will drive customers away.

These customers include some of the largest telecommunications users in the country. For fear of losing them, some of the former Bell operating companies are trying to pull an end run maneuver on the access charges by filing new, lower rates with state public utility commissions that would obviate the access charges' effect.

This practice is being opposed by the North American Telecommunications Association, the trade association of independent manufacturers and suppliers of communications equipment, which argues that lowering Centrex rates is tantamount to cross-subsidization and is not in the public interest.

The former Bell operating companies counter this by arguing that if Centrex customers are forced to abandon the service, all ratepayers will suffer as telephone companies try to deal with the whipsaw effects of lost revenue and stranded investment.

How could a $2 Centrex access charge wreak such havoc, especially in light of the fact that, under the FCC access charge plan, the fees for other business lines will range up to $6 per line?

Centrex services are provided by letting users tap directly into a telephone company's central office switch, which supports all business and residential

See CENTREX page 70

National consortium proposed

To meet telecommunications needs

By Lynn Haber
CW Staff

ORLANDO, Fla. — At a meeting here last week, an ad hoc planning committee consisting of representatives from the telecommunications industry, education and government laid the groundwork for the development of a national organization for telecommunications education.

Designed to expand and improve the quality of education and training to meet the needs of the domestic and international telecommunications industry, the National Telecommunications Education Council (Ntec) will be established as a nonprofit association of organizations for users and individuals from the public and private sectors of education and the telecommunications industry.

The original call for the creation of a national consortium to meet the growing demand for telecommunications technicians occurred at the two-day Telecommunications Education Conference held in Detroit in January. That conference was jointly sponsored by MCI Communications Corp., the American Association of Community and Junior Colleges and the Association of Community College Trustees.

At the Detroit conference, Bert C. Roberts, president of MCI, told an audience of 120 participants that the demand for trained telecommunications technicians was running 30% to 50% above availability in some areas of the U.S.

At the Ntec planning meeting, preliminary charter bylaws and organizational plans were drafted. Goals established for Ntec included:

- A need for an industry education survey to identify telecommunications training materials available for use by educators and to identify current telecommunications programs offered.
- The formation of a telecommunications education institute that would be a joint venture between the North American Telecommunications Association and Ntec.
- The creation of a quarterly newsletter relating to training in telecommunications.
- The development of a national clearinghouse as a resource center where information on people, places or things related to telecommunications could be found.

See NTEC page 70

NCR unleashes product package

ST. PAUL, Minn. — In a flurry of product announcements, NCR Comten, Inc. has introduced eleven models of its 8600 communications processor; software support for the models; the Automatic Message Switch; and the Comten Communications Access Method 3 (CAM3) Release 1.0.

Ten similar 8600 processors, Models A3 through K8 (NCR does not produce a Model I5), are configured with a minimum of 512K bytes of memory and can be expanded to 4M bytes. Depending on the model and features selected, up to 512 communications lines and up to 8 channel-attached hosts can be simultaneously supported. The models can be configured for standalone, front-end or remote communications environments depending on the model specified, the vendor said.

System software support for the models includes the company's System Control Software (SCS), Communications Operating System 2/60 (COS2/60) and COS2/90, the vendor said. Prices range from $105,000 to $156,000.

The eleventh model, the T8, has 512K bytes of memory with 128 communications lines and two channel-attached hosts. System software includes SCS and COS2/60. The price is $66,000.

The Automatic Message Switch (AMS), is reportedly the first communications application program in the data communications industry to reside in an IBM Systems Network Architecture (SNA)-compatible front-end processor.

The AMS adds store-and-forward message switching services to the networking capabilities of the company's 8600 communications processor systems. The application program manages data communications with predefined terminal sets and queues messages for delivery to other terminals or host-resident applications.

Recovery, restart, retrieval and journal-

See NCR page 70

Report analyzes buying stimulus, advances in PBX mart future

WELLESLEY, Mass. — Private branch exchange (PBX) switches are purchased for voice-handling capabilities such as least-cost routing, speed calling, call restriction and direct dialing, as opposed to advanced data-handling features, according to a report released here recently.

The study, titled "The PBX Industry: A Strategic Analysis," published by Venture Development Corp., reports that the factory value of U.S. shipments of PBXs is now in excess of $1.5 billion. In five years, the market will exceed $2.5 billion.

Researchers found that the stimulus for industry growth won't be the result of a desire to create an "office of the future," and that even in the case of sophisticated third-generation PBXs, advanced data handling capabilities are desired mostly as a hedge against the possibility that they will be necessary in the future.

Data capabilities a factor

This, the report said, makes data capabilities a factor considered in selecting the specific supplier and model, but is not a factor in deciding whether or not to buy a PBX.

Researchers concluded that the office of the future evolution will proceed gradually, and Venture does not believe there will be a sudden, overwhelming demand for the new PBXs. Instead, the research company forecasts moderate growth. The more important technological advances are going to be made in the voice/data PBX field, rather than in the data-only PBX market, according to the report.

Data-only PBX sales are concentrated where large amounts of data are transferred in large companies, the report stated. They are sold to the department within the user company that also purchases local-area networks — the data processing group.

Eventually, there will be increasing integration of voice and data responsibility, the report continued, but it is unlikely that in the next few years those responsible for voice communications are going to add another PBX and a new system of interconnection unless the volume of data to be handled makes the combined cost of a voice-only and data-only PBX much cheaper than a voice/data PBX.

Venture believes that, for the next five years, sales of data-only PBXs will come from market niches that would not have been occupied by voice/data PBXs in any case.

The report is priced at $2,790 and is available from Venture Development, which is located at One Washington St., Wellesley, Mass. 02181.

SYSTEMS FOR DP MANAGEMENT

COMMUNICATIONS

COMMUNICATIONS CONTROLLERS

DATAGRAM, INC.
DM2300B with Softswitch

Datagram, Inc. has announced the DM2300B communications processor with Softswitch, a system which enables Burroughs Corp. computer users to switch individual terminals selectively from host to host without affecting other terminals.

A single DM2300B with Softswitch can support a cluster of 40 terminals in the same location on multiple terminal direct interface strings. It can also support multiple RS-232 synchronous links to host computers in several other locations, the vendor said.

The communications processor with Softswitch completes the existing Datagram network architecture. Prices range from $16,000 to $21,100, depending upon configuration.

Datagram, 11 Main St., East Greenwich, R.I. 02818.

VOICE/DATA COMMUNICATIONS

M/A-COM, INC.
CP9000 Series II

M/A-COM, Inc. has announced the CP9000 Series II network node for applications such as packet- or message-switching networks.

This series utilizes a multimicroprocessor architecture capable of supporting several thousand communications lines for value-added network applications. It features some redundancy for fault-tolerant operation and security options.

Software for the series includes an X.25 packet-switching network along with routing, statistics, billing and network management and control features. Prices for a stand-alone system range from $15,000 to $250,000.

M/A-COM, 11717 Exploration Lane, Germantown, Md. 20874.

ADVANCED FIBEROPTICS CORP.
AFL-100

Advanced Fiberoptics Corp. has introduced the AFL-100 fiber-optic data link, designed for low-speed (less than 200K bit/sec) applications.

The product provides modem-recognizable signals and allows loopback testing of the transmitter and receiver electronics. The link was designed for Cmos and transistor-to-transistor logic integrated circuits, supports asynchronous and synchronous serial data transmission and requires a single 5V power supply. The link consists of the AFT-100 transmitter and the AFR-100 receiver. The price per pair is $90.

Advanced Fiberoptics, 637 S. Hayden Road, Tempe, Ariz. 85281.

PROTOCOL CONVERTERS

DIVERSIFIED DATA RESOURCES, INC.
Security feature for Hydra II

Diversified Data Resources, Inc. has announced a security feature for its Hydra II direct channel-attach protocol converter.

The new feature automatically sends a logoff sequence to the host mainframe if the line drops during communication or if the user forgets to log off.

The eight-port unit costs $6,900; the 16-port unit is priced at $9,900.

Diversified Data Resources, Suite 7, 25 Mitchell Blvd., San Rafael, Calif. 94903.

ICOT CORP.
362 protocol converter

Icot Corp. has announced the 362 protocol converter, which combines protocol conversion, line concentration and terminal emulation to allow asynchronous Ascii terminals and personal computers to emulate IBM 3270-type terminals and printers.

The product employs three processors and offers throughput for applications such as personal computer-to-mainframe file transfer. Standard features include emulation of an IBM 3274 Model 51C controller operating with Systems Network Architecture/Synchronous Data Link Control protocol, 19.2K-byte host and terminal support, split-speed RS-232C or RS-422 interfaces for asynchronous terminals and personal computers, table-driven configuration control and a message broadcast facility, the vendor said.

The standard configuration includes one host port and 16 terminal ports. The price is $8,800.

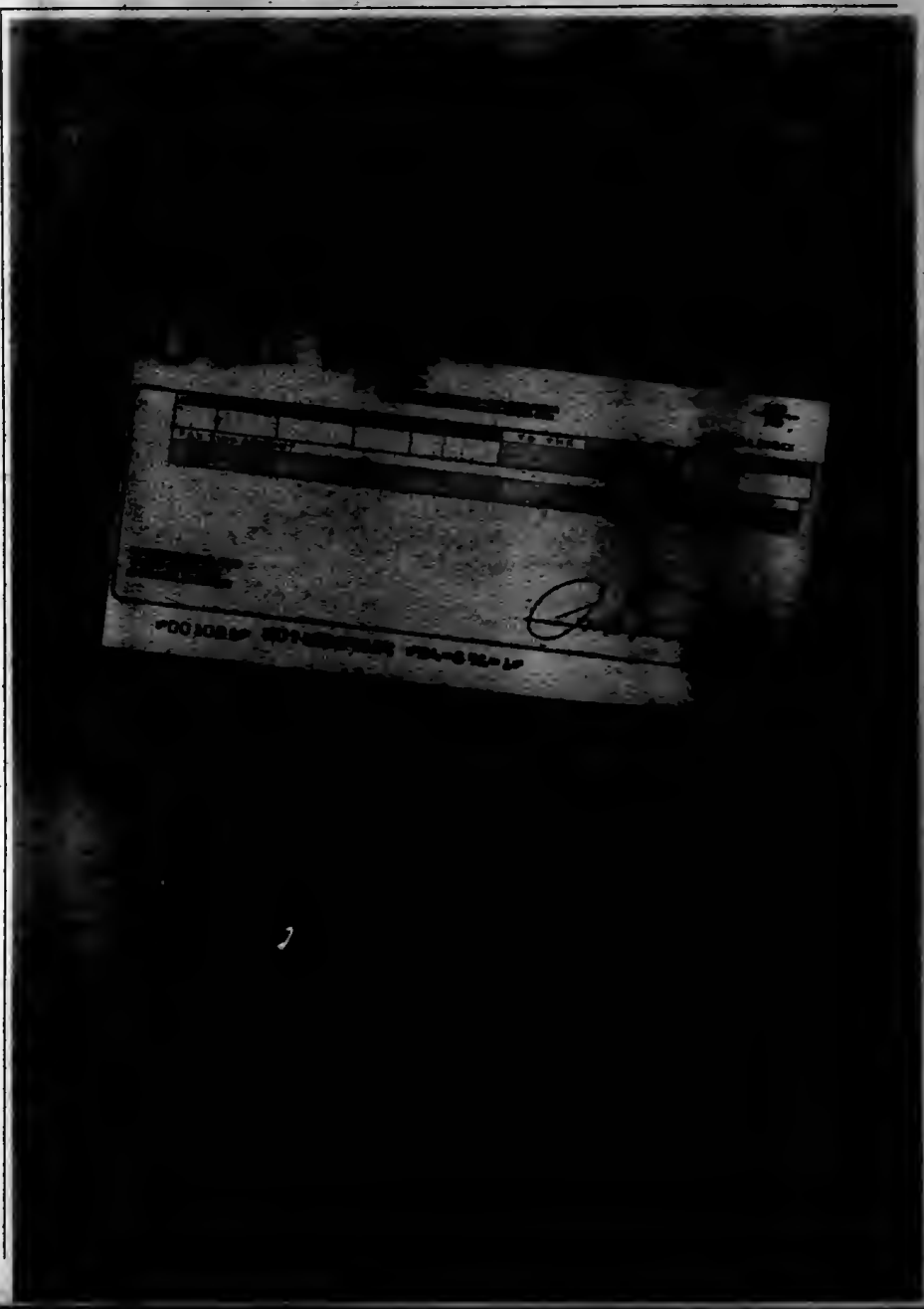
Icot, 830 Maude Ave., P.O. Box 7248, Mountain View, Calif. 94039.

COMMUNICATIONS SOFTWARE

MORINO ASSOCIATES, INC.
T/M Online

Morino Associates, Inc. has announced T/M Online, which the company described as an interactive TSO monitor providing real-time access to

Continued on page 68



COMMUNICATIONS

Continued from page 65

current status and utilization of TSO.

According to the vendor, using terminal displays, T/M Online assists the data center manager, operations personnel and systems programmers in tracking TSO performance, service and work-load-related problems.

The T/M Online displays the TSO System Summary Display, Response Analysis Display, Workload Analysis Display, Command Summary Display, MVS Malfunction Analysis Display, Primary Options Display, TSO User Display and Error Display, the vendor said. The price is $6,500, with a $1,300 first-year renewal fee.

Morino Associates, 8133 Leesburg Pike, Vienna, Va. 22180.

DATANEX, INC.
Version 4.0 of Hasp+

Datanex, Inc. has announced Version 4.0 of its Hasp+ communications software for users of Digital Equipment Corp.'s PDP-11 and VAX series computers.

The new version of the software supports the DEC DMF32 combination board on VAX systems. This allows users to use front-end direct memory access (DMA) capabilities at speeds to 56K bit/sec. It also provides eight DMA asynchronous lines and a DMA line printer interface. For PDP-11 users, the software supports DEC's DPV11 synchronous interface on Q-bus machines.

Enhancements for VMS users include support for automatic dialing, including alternate numbers for the same site. A new host-mode functionality has also been added to allow VMS systems to act as the mainframe in a remote job entry network. The price is $5,500.

Datanex, P.O. Box 1728, Eugene, Ore. 97440.

EDUCOM
Dreams-Mailnet Interface

Educom has announced that a software interface for Mailnet, the company's international electronic mail network, is available with DCXX Software Service's electronic mail software package called Dreams.

The Dreams-Mailnet interface provides users of Digital Equipment Corp.'s PDP/11 series, running under DEC's RSTS, with a link to Mailnet. The interface allows users to create, send and receive messages directly and communicate with other users with no additional hardware or operating system modifications. The price for the package is $3,000.

Educom, P.O. Box 364, Princeton, N.J. 08540.

MULTIPLEXERS/ MODEMS

CODEX CORP.
6095 INP

Codex Corp. has introduced the 6095 INP 124-channel statistical multiplexer designed to operate in both point-to-point and multinode networking environments, including star and ring network topologies.

The network management and control capabilities of the multiplexer include performance monitoring, statistics gathering and reporting and execution of a set of local and remote diagnostics. These functions can be centralized at one site or distributed to many nodes in a network, the vendor said.

The product accommodates any mix of asynchronous or synchronous data rates and terminal types and offers additional error protection and data compression features. Standard asynchronous speeds include 75, 100, 300, 600, 1,200, 2,400 and 4,800 bit/sec, while standard synchronous data rates include 1,200, 2,400, 3,600, 7,200 and 9,600 bit/sec. The multiplexer's maximum aggregate channel data rate is 19.2K byte/sec, the vendor said.

The basic configuration includes 16K bytes of random-access memory and supports eight channels. The price is $4,500. Units will be available in April.

Codex, 20 Cabot Blvd., Mansfield, Mass. 02048.

GANDALF TECHNOLOGIES, INC.
PIN 9101E

Gandalf Technologies, Inc. has announced the PIN 9101E, an enhanced version of the company's Private Intelligent Network (PIN) 9101 X.25 packet-switching multiplexer.

The enhancements include automatic speed adjustment; Hewlett-Packard Co. protocol support for enquiry/acknowledgement block-mode terminals; X.28 support to allow the user to control his own asynchronous channel configuration; aggregate input rate of 57.6K bit/sec; full break handling; and enhanced remote profile selection, the company said.

The product functions as a network starter kit and provides access to public X.25 networks and provides a packet assembler/disassembler function for private X.25 networks, according to the vendor.

The product is available in 4- or 8-channel stand-alone or 4- to 16-channel rack-mounted versions. Prices range from $2,650 to $5,250.

Gandalf Technologies, 1019 S. Noel, Wheeling, Ill. 60090.

GANDALF DATA, INC.
Sm/LDS 349

Gandalf Data, Inc., a subsidiary of Gandalf Technologies, Inc., has introduced the Sm/LDS 349 miniaturized synchronous short-haul modem, which operates over nonloaded, twisted wire pairs at speeds up to 19.2K bit/sec within a range of 3 to 6 miles.

The modem is designed to plug directly into terminals with RS-232C, V.24 or V.28 interfaces, personal computers and other data terminal

Continued on page 72

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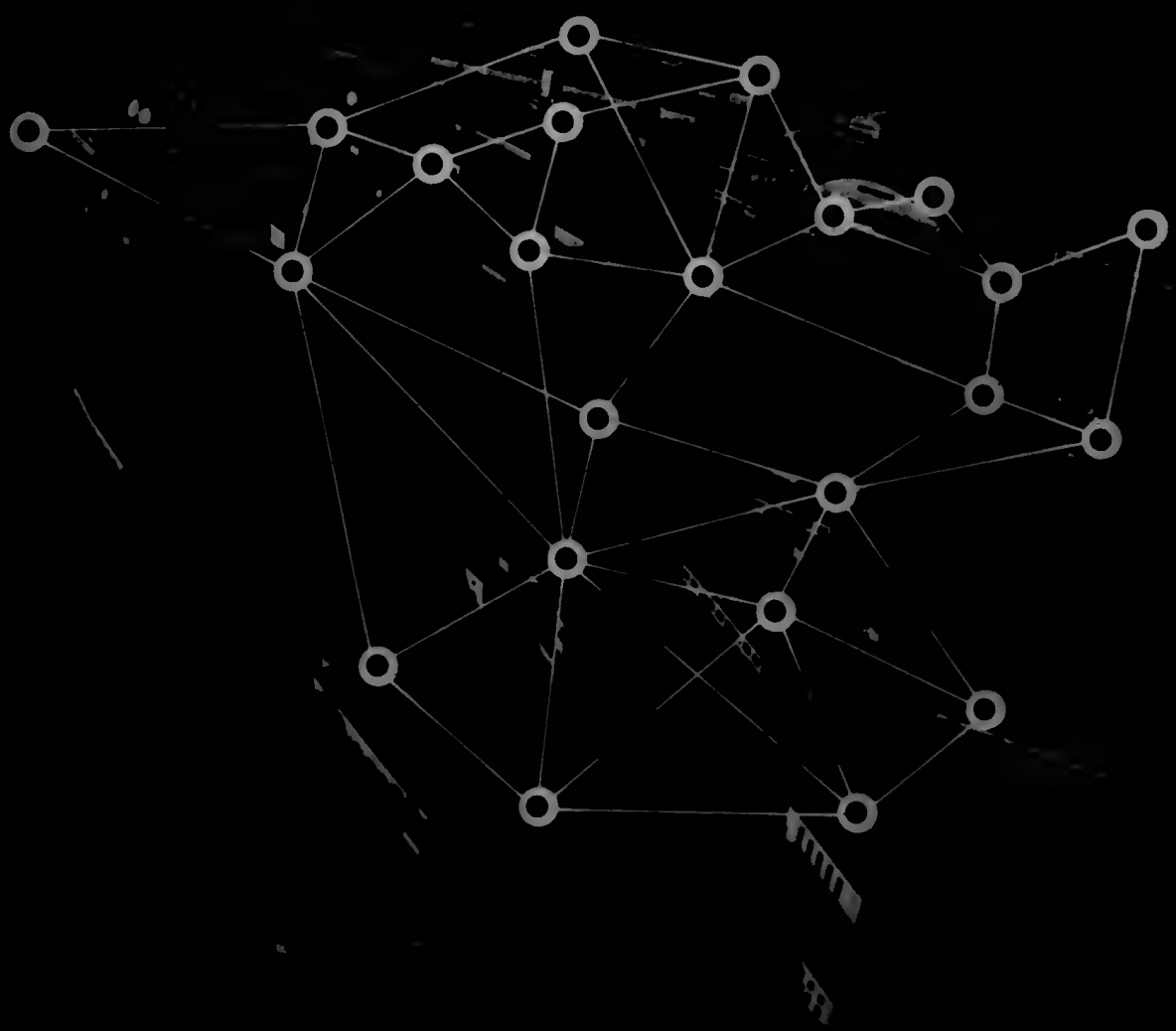

At NASA's Ames Research Center, hundreds of scientists share hundreds of programs on one large computer network:

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Aircraft design. Space biology. Computational fluid dynamics. Infrared astronomy. Interplanetary exploration. At NASA's Ames Research Center, the technology couldn't get more advanced. That's why Ames scientists share a network of over 50 of Digital's computers and two large mainframes.

Everyone on the Ames network has access to almost every computer on it. Researchers share not only data, but software, utilities, and peripherals as well. A program written anywhere is often useful everywhere on the network, so there is practically no duplication of effort and almost no need to retrain users when new programs are added. The savings, in time and money, are substantial.

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So if you're considering a network, talk to Digital. We'll show you how you can start as small as you want. And grow as large as you need.

digital™

NCR from page 63

ing functions are supported. Network users can also, without knowledge of the network configuration, reach any application on any host in the network and can access host and AMS applications in multinetwork domains, according to a company spokesman.

Data-sensitive routing, terminal-to-terminal communications and network security are also supported under AMS.

AMS is the first communications application program implemented with the newly announced CAM3 Release 1.0. The CAM3 allows users to implement value-added features, like AMS, and future communications within an SNA environment, the vendor said.

For store-and-forward message handling, AMS supports IBM 3330/3350 or compatible disk units. Terminal devices supported with AMS include TTY 33/35, 3741, 3270 Bi-synchronous, 2780/3780 Bisynchronous, 3270 SNA and 3767 SNA. AMS also supports communications with IBM SNA host applications and pre-SNA host applications, the vendor said.

The price for AMS (which includes CAM3) is $945/mo. The individual price for CAM3, for users who write their own applications, is $360/mo. These two products will be available during the fourth quarter of 1984, according to the vendor.

Additional information can be obtained from NCR Comten, which is located at 2700 Snelling Ave. N., St. Paul, Minn. 55113.

NTEC from page 63

Plans were also made to have a national telecommunications education conference to formalize and finalize the plans.

Fees will vary

Funding for Ntec is proposed to come from membership fees and dues, which will vary for industry, educational institutions, faculty members, professionals and students.

A spokesman for the U.S. Department of Education said the government was committed to providing staff support in an advisory capacity to Ntec, as well as peripheral financial support in the form of computers, the establishment of data bases and so forth.

A spokesman for the ad hoc committee said that it is the goal of the committee to formalize the creation of Ntec by fall 1984.

CENTREX from page 63

telephone lines. Centrex users don't house any switching equipment or PBXs.

Typically, PBXs have trunking ratios of between 10% and 15%; that is, a single telephone line connected to a PBX will usually provide adequate support for 10 to 15 telephones.

With Centrex, every telephone must be supported by an individual line running back to a telephone company central office switch.

Herein lies the problem created by access charges.

An organization with a PBX that supports 1,000 telephones would use between 100 and 150 telephone lines. If that same company used Centrex, it would need 1,000 telephone lines.

The economics are easy to calculate. In the above example, the organization with a PBX faces access charges that may range up to $600 per month. The Centrex user, while he pays a lower access fee per line, will have to pay $2,000 per month.

And it gets worse. The Centrex access charges are slated to go up to $3 per line in 1985 for lines installed before July 27, 1983 and to $4 per line in 1986. Referring again to the example used above, by 1986 the Centrex user would be paying $4,000 per month, or $48,000 per year, in access charges.

Unless telephone companies can find some way to compensate users — by lowering rates, for example — many Centrex customers will consider installing PBXs.

COMMUNICATIONS

Continued from page 66

equipment. It operates at switch-selectable speeds of 2,400, 4,800, 9,600 and 19.2K bit/sec in controlled-carrier mode. At 2,400 bit/sec, the unit's operating range extends to 6 miles.

The modem meets AT&T 43401 and Bell Canada requirements for connection to private metallic circuits. The price is $295.

Gandalf Data, 1019 S. Noel, Wheeling, Ill. 60090.

TEST EQUIPMENT

INTERNATIONAL DATA SCIENCES, INC.
Model 61/90 EIA Tri-State LED Breakout Box; Analog Test Set

International Data Sciences, Inc. has announced the Model 61/90 EIA Tri-State LED Breakout Box and Analog Test Set, a battery-operated tester designed to troubleshoot both the digital and analog side of the modem.

The product provides access to all RS-232C and V.24 conductors at the modem-terminal interface and tests all leased or dedicated 2- or 4-wire telephone lines.

The product incorporates modem loop-back, self-test and modem eliminator simulation with terminal-modem interface and EIA interface monitoring, a vendor spokesman said. The price is $595.

The company also announced enhancements for its Hawk Model 4010 Datatrap and modem-terminal stimulator, which include full bit and block-error rate (Bert/Blert) testing as a standard feature. The unit costs $2,995.

International Data Sciences, 7 Wellington Road, Lincoln, R.I. 02865.

AUXILIARY EQUIPMENT

MICROLOG CORP.
Intelecom

Microlog Corp. has announced the Intelecom telex communications system, which allows users to access telex, TWX, Direct Distance Dialing, mailgram, telegram and cable. It can also be used to communicate with computers and word processors.

The system dials telex and TWX numbers and automatically negotiates the necessary protocols. It delivers a real-time or store-and-forward message and makes hard copy of all communications, according to the vendor.

System components include a keyboard, video monitor, high-speed printer, cassette tape storage system, work table and interconnecting cables. The price is $4,995.

Microlog Corp., Suite 116, 4 Professional Drive, Gaithersburg, Md. 20879.

INNOVATIVE ELECTRONICS, INC.
Data Collection System

Innovative Electronics, Inc. has announced the Data Collection System, a microcomputer-based data acquisition/supervision system.

The system provides the user with records of time and attendance, inventory control, patient-records accounting, positive-sample tracking (shipping and receiving), quality control and customer charge-back.

The system operates in either a stand-alone configuration or in conjunction with a host computer. The hardware components include the company's Netmaster — a 16-bit computer which may be connected to as many as 96 of the company's Transactor terminals.

The price for the system ranges from $10,000 to $50,000, depending on individual applications.

Innovative Electronics, 4714 N.W. 165th St., Miami, Fla. 33014.

FIBRONICS INTERNATIONAL, INC.
Coaxial Doubler

Fibronics International, Inc. has introduced the Coaxial Doubler, a connecting module that condenses the signals from any two ports of an IBM 3274 controller over a single coaxial cable and supports two IBM 3270-type peripherals.

According to the vendor, the Doubler can be installed by a user in minutes without special tools. It requires no external power. A pair of doublers is priced at $490 and can be delivered in 48 hours.

Fibronics International, 213 W. Main St., Hyannis, Mass. 02601.

PHILIPS ELECTRONIC INSTRUMENTS, INC.
Flexpac

Philips Electronic Instruments, Inc. has introduced Flexpac, a line of X.25 packet-switching equipment that includes a network management device, packet assembler/disassembler (PAD) modules and network switch modules.

The remote diagnostic and network management capabilities assist the end user in isolating line, terminal, host computer and equipment problems on a remote basis. The modules concentrate multiple asynchronous terminals to an X.25 network line. Models are available for use with seven or 15 asynchronous ports.

The network switch modules provide internal virtual circuit switching between all X.25 ports, as well as the routing, switching and number translation necessary to interconnect private and public networks with different capabilities and numbering plans. Prices range from $3,950 to $43,300, depending on configuration.

Philips Electronic Instruments, 85 McKee Drive, Mahwah, N.J. 07430.

ADM CONCEPTS, INC.
Commlock Model-96A

ADM Concepts, Inc. has announced the Commlock Model-96A, an asynchronous data encryption device that is connected between a terminal device (CRT or printer) and a communications device (modem, multiplexer port or computer port) via an RS-232C interface.

It also provides separate encryption codes for the transmit and receive paths. Commlock is programmable for data rates of 300 to 9,600 bit/sec, selectable word length (5-8 bits), parity and number of stop bits, the vendor said. The unit costs $600.

ADM Concepts, Suite 201, 1445 Los Angeles Ave., Simi Valley, Calif. 93065.

SPECIAL REPORT

Network solution: panacea or placebo?

Edited by Jim Bartimo

February 27, 1984

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

SPECIAL **REPORT**

Mart emerging for user-controlled nets

By Ben Kruckmeyer
Special to CW

Fifteen years after the Carterphone decision, many companies provide communications equipment for the user's site, and many carriers provide a system for site-to-site communications as well as competing for on-site communications requirements. Now, a new generation of equipment is moving into the marketplace that allows the user to own (control) his local-area communication facilities.

Descripters such as local-area network, local computer network, establishment network (by IBM) and local-area distribution describe the equipment, software and service provided for intrasite communications that are not required to be supplied by a common-carrier. When communications of data or voice, up to and including the day of the modem and handset, was supplied by the common carriers, terms such as local-area network were not required; the common carrier supplied it all.

From the user's perspective, networks that are not common-carrier-supplied have a key distinction — the user completely controls them. Obviously, user-controlled networks can be desirable or unworkable, depending on the user's resources and technical capabilities. The last 15 years have proven that customer-controlled networks are very desirable to many users.

The market for customer-controlled networks has been emerging since 1968. First, companies such as Rixal-Milgo, Inc. and Codex Corp. began to provide the equipment to allow customers greater control of their common-carrier-supplied leased lines. Then, companies such as Rolm Corp. and Northern Telecom, Inc. began to provide private branch exchange (PBX) systems to allow customers control of their local voice-switching equipment.

Now these companies and many others are offering systems and equipment to integrate the customer's control of voice and data wherever a common carrier facility is not required or to provide expanded customer control where common carrier services are utilized.

The broad range of potential customers and the unique requirements of each customer have generated a large, expanding range of products and services for the customer-controlled network market. Looking at the different products in historical perspective may provide a better view of future possibilities.

PBXs have emerged as a new form of star network for data communications for two underlying reasons. One is the ability to connect non-common-carrier-supplied devices to all PBXs. In 1976 the Federal Communications Commission implemented Part 68 — registration for direct connection — allowing users to connect modems directly to common carrier facilities, including common-carrier-supplied PBXs.

The other reason is the dramatic increase in the cost of installing cable of any kind, due to more extensive regulations of all kinds (fire codes, unions, FCC Part 15 and so forth) and rapidly rising labor costs. PBXs are the most common form of star networks.

As more and more PBXs are customer owned, new features are evolving to allow data communications on this traditionally voice communications device. The evolution is taking two major directions. Companies such as Teltone Corp. offer the ability, using FCC-registered interfaces, to connect to any common-carrier-supplied or non-common-carrier PBX and transfer data up to 9,600 bit/sec over the same wire pairs that are being used for phones, even, cleverly enough, while the phone is being used for voice.

The Teltone approach requires the use of external port switching (similar to line drivers) for terminal-to-terminal communications. A new generation of PBXs is completely digital and therefore allows for data transfer, including port switching, as an inherent part of its design.

Manufacturers such as Rolm and Northern Telecom are currently manufacturing these digital PBXs. All of these products represent direct competition to line drivers in the local network area, as they provide star networks of similar or greater data rates without the necessity for running separate wire pairs.

Further, these PBXs are the natural extension of line drivers and port switches, combining the data handling capabilities of line drivers and port switches with the voice handling capabilities of PBXs to give the user more features, more control and lower total system cost.

Standards developing

Communications, by definition, is a technology that requires standardization to be able to function. The lack of comprehensive standards and the broad array of noncompatible products has been and continues to be the basic problem hindering the growth of customer-controlled networks. The Consultative Committee on International Telephony and Telegraphy (CCITT) and the International Standards Organization are developing comprehensive interfacing standards.

Starting with its Open System Interconnection, which specifies the seven levels of protocol necessary to achieve application-to-application communications compatibility across an interface, CCITT has developed detailed standards for five of the necessary protocol levels.

The CCITT X.25 standards describe the implementation of five levels of communications compatibility, but still leave unspecified the application and presentation levels. In the U.S., the Institute of Electrical and Electronics Engineers (IEEE) 802 Standards Committee is also working on standards for networking, and drafts are currently being reviewed. The European Computer Manufacturers Association (Ecma) is also currently working on a local network standard.

As these standards are completed and the implementation is worked out, the problems the user faces in choosing a communications networking approach will become somewhat more reasonable. Unfortunately, many users are hanging back waiting to see if vendor-sponsored standards will become generally utilized or if CCITT, IEEE or Ecma standards emerge with wide acceptance.

This state of affairs means the dominant manufacturers effectively force their own standards on their user community. In this environment (lack of broad, accepted, implemented standards), the user community is holding back its commitments to new forms of customer-controlled networks as long as possible. This is not a realistic approach.

IBM users have generally accepted Systems Network Architecture (SNA), probably because of a lack of other alternatives, but are still waiting to see the total range of products supported. The Xerox Corp. Ethernet implementations, which are gaining in number, also have a realistic chance to succeed in the marketplace. Xerox should be applauded in the user community for offering a broad licensing approach to allow many manufacturers to develop products, not maligned for failing to produce the perfect network, because there is no such thing.

Between the very broad, de facto SNA standard and potential local-area network standards such as IEEE 802 lies a wealth of usable technology and capabilities. AT&T and IBM are planning to produce new implementations of local-area networks. Emerging companies such as Metapath in Foster City, Calif., and Interlan, Inc. in Westford, Mass., offer low-cost, user-oriented networking approaches.

The organization striving to implement customer-controlled networks for current and future requirements has no reason to believe that it can or should pick one vendor or networking system.

Rather, the current technology and the standards environment suggest that networking equipment should be chosen based on the best combination of hardware, software and support available to solve the current needs. So long as the hardware and software selected offer clear interfaces to allow connectability to future systems, expansion will not be sacrificed. Nor will it be simple.

Single-vendor solutions are not going to predominate in the world of customer-controlled networks. Customer-controlled networks is the direction that users have asked for. Now, with the AT&T divesture, it is the direction they will have.

Kruckmeyer is product architect at Prentice Corp., Sunnyvale, Calif., and is a principal in Action Consulting, a sales and marketing consulting firm specializing in the development of data communications products and markets.

INSIDE

SPECIAL REPORT

Network evolution: Putting it in perspective

Growth of strategically important DP sector

By Ronald M. Groenke
Special to CW

Data communications is emerging as one of the most strategically important sectors within the information processing industry. One of the critical reasons for this trend is that data communications enables a global exchange of information. There are no bounds to it, and its functions are worldwide, driven by reasons of profit and even national security. As a major element in today's expanding business and data processing environments, data communications provides a cost-effective way to do business on a global scale (see story on SR/4).

To understand the current and emerging capabilities in today's data communications networks, we need to put in perspective the network evolutions that have occurred in the last 20 years.

The first networks occurring during the '60s basically connected a terminal operator directly to a host computer. All facilities were dedicated. The terminal — local or remote — the communications processor and the host were all dedicated to the application. As a result, initially only large applications such as an airline reservation system could justify and afford to use communications.

In this initial phase, there was little real networking activity as we know it today. There was a direct point-to-point connection, with the lines directly attached to the system, and no interaction among multiple computer systems. In this environment, the implementation was done with hard-wired controllers and multiplexers. If, for example, an aircraft maintenance worker wanted to get at some information being maintained on the reservation application, he needed his own terminal and his own set of facilities.

Networks of the '70s

Progress was made very quickly to eliminate some of these shortcomings. In the '70s, for example, a significant amount of networking activity was introduced. First of all, communications were provided between multiple host computer centers, basically the first networking function that took place. The next development was to attach remote processors out in the network to provide some form of sharing or concentration. This first level of networking in the '70s included a form of concentration within the networking capability, trunking, line switching and support for multiple host processors. In other words, we had implementations that provided a network.

The concept of trunking, which connected lines between network nodes, was introduced in the '70s. The reasons for this capability are many. With a set of multiple circuits, there is a limit of some fixed bandwidth — whether it is 9,600, 19.2K up to 56K bits — that can be economically acquired from a common carrier. But if multiple circuits or a large bandwidth is needed between multiple locations, the user will have to install multiple links.

The first concept of trunking was to take the multiple links between nodes and group them as a trunk. The resulting combined bandwidth would allow the addition of the individual line capacities and would provide a basic trunk bandwidth between two nodes. Data now could flow on multiple links between the nodes without being dedicated to one physical link.

In addition to increased bandwidth, trunking provided some reliability and some fallback. If a line was getting a high error rate, for example, or was put out of service, there would be an automatic fallback to the remaining circuits on that trunk, with no disruption in service other than, possibly, diminished response time. Service, however, was still maintained between the network nodes.

As a second major capability, the concept of alternate routing was introduced. In a multiple-node network, alternate routing allowed the user to design the network to have an alternate path through some other node in the network. It provided for a fallback method of continuing to communicate when a major catastrophe occurred, such as a large set of circuits disappearing because a microwave station was destroyed or a facility was damaged. The trunking concept, then, provided for this level of capability in the '70s.

The next major element was data concentration. Data concentration was introduced to increase the utilization of the bandwidth or to utilize the bandwidth in an optimal fashion between nodes in the network. The underlying principle was to avoid loading the network with unnecessary traffic that was not real data traffic. As a result, data concentration allowed the remote processor to control the terminal. Once the real data was obtained from the terminal, the data was then transmitted through the network to a front-end processor to the host application. That form of concentration basically increased bandwidth utilization, specifically the long-haul bandwidth that has always been expensive.

Also introduced in the '70s was terminal-initiated line switching. Early networks used dedicated terminals and lines directly attached to the application. Terminal-initiated line switching allowed the terminal user to select different applications in the network. As a result, the user could make more efficient use of the terminal and the lines in the network.

In the airline reservation system, for example, maintenance personnel could use the same reservation terminal to get some maintenance information on a flight.

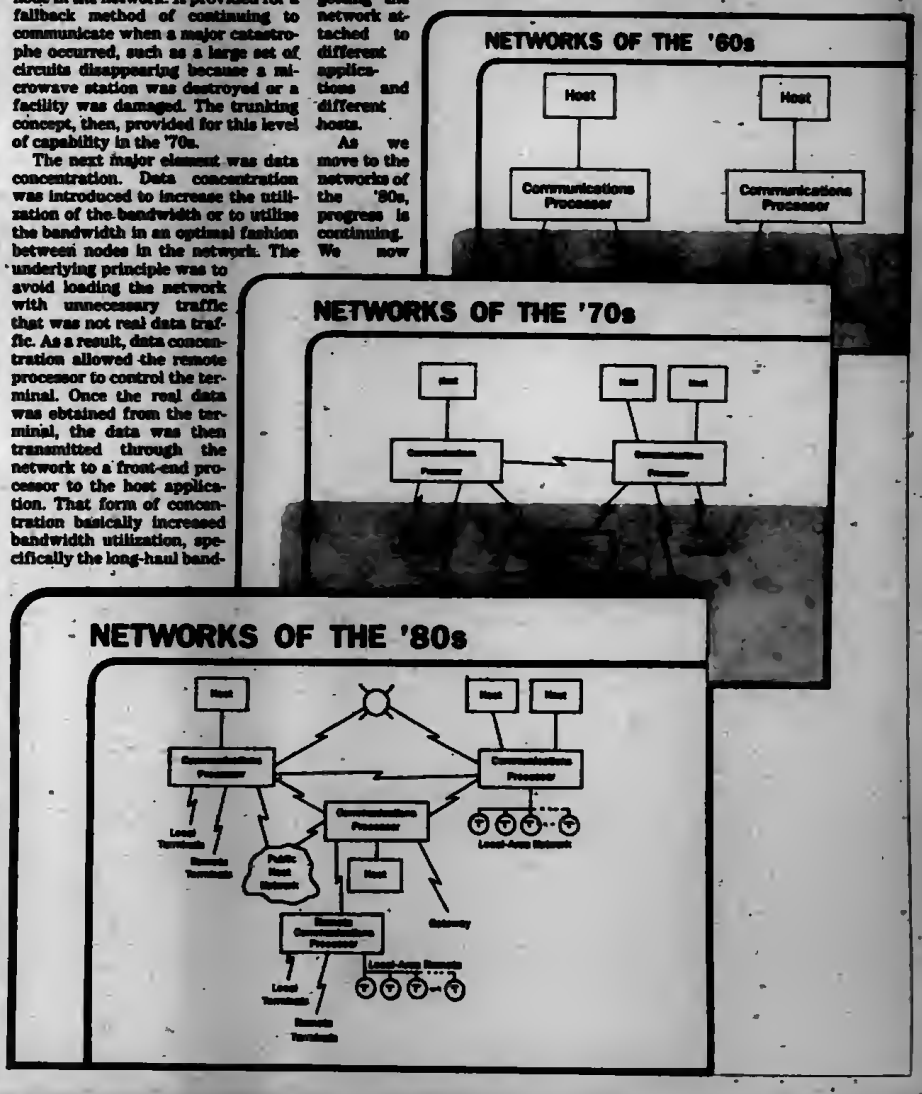
The concept of multiple host processors also became important in the '70s as the environment grew too large to be supported by individual processors. With multiple processors existing in a single large data center, terminals now had to access more than one host. This concept again allowed for the sharing of the network, getting the network attached to different applications and different hosts.

As we move to the networks of the '80s, progress is continuing. We now have regional data centers existing in networks, which are utilizing all forms of common carrier and local facilities. The attachment of public data networks is being provided for and even being used for part of the trunk bandwidth between nodes within the network.

The technology of the '80s is diverse. There are many competing technologies for local-area networks, and which ones will win will take some time to determine. But the connections will have to take place in the future. The important issues in networks in the '80s include packet and circuit switching, session switching, transaction switching, the introduction of satellites, gateways, the attachment of the local-area network and the trends toward IBM's Systems Network Architecture.

The concept of circuit switching through a data communications network is one involving a dedicated

See NETWORK SR/6



SPECIAL **REPORT**

Trends signal future evolution of networks

SNA, public nets, micros, data centers seen significant

With the evolutions in networking, some questions arise: Where do we go from here? What else can the communications product vendors provide, and where is networking going? Some industry trends are emerging to provide answers to those questions.

One of the major considerations is that migration to IBM's Systems Network Architecture (SNA) protocol is occurring at a rapid rate. It is predicted that by 1985, 80% of all large IBM information processing systems will be performing some form of SNA communications. For the total IBM user base, SNA communications is predicted to reach around 60% to 65%. SNA is becoming a standard, and any networking plan has to consider this in its communications solutions.

Public data nets

Another consideration is the growth of public data networks, which are becoming a major factor in communications. One of the unique characteristics about public data networks is that they are based on an international standard — CCITT X.25. What we see happening throughout the world is that major countries are establishing networks based on X.25. With this common base, those countries can interconnect and communicate.

Countries around the world are establishing networks, and these networks, in many cases, are available today through the different postal, telegraph and telephone organizations. Japan has networks to which organizations can subscribe; the network in Australia is under development; in Europe, each major country is providing a packet network capability.

In North America, one of the first networks provided in the world was Datapac in Canada, and Bell Canada was an early promoter of packet network capability. In the U.S., a number of vendors provide packet network service, and in the future, AT&T will be able to provide a basic packet-switching service.

All of this means worldwide X.25 capability based on an international standard and organizations adopting that standard with very little modification.

Large data centers

Another consideration is the expansion of large data centers. In the last three or four years, we have seen a yearly expansion rate of over 50% for the host processor cycle required to do an application. This demand is mostly being driven by the requirement for on-line communications and the processing of the new information that the data communications network is putting on the host data center.

One of the reasons for this continued growth is declining costs. The cost per one million instructions per second has been reducing continually in the last 20 years, and it will still continue to decline.

Technology is also providing for this expansion in the data processing environment. By 1985 or 1986, organizations will be able to get an integrated circuit with 500,000 transistors. That half-million-transistor chip will occupy less space than the first transistor, developed just 30 years earlier.

Using new technology

We are also seeing the research organizations in major companies investing major resources to use this new technology. Their efforts in many cases are directed toward the information processing environment and the handling of data communications.

Finally, the personal computer will have a major impact on future communications networks. In 1983, approximately two million units were shipped, and we are approaching the point where micros will exceed the shipment rate for CRT terminals. The personal computer is now becoming the new information-handling device of choice.

By 1987, the expected annual shipment rate is seven million personal computers, with an anticipated installed base of approximately 50 million devices. Combine the CRT terminals that exist today with shipments of personal computers, and the figure will be close to one-fifth of the installed base of the telephone.

All of these trends are feeding the demand for on-line applications and networking capabilities ranging from local to global levels. In essence, these trends are moving data communications into the forefront of the maturing information processing industry. Advances in data communications will be integral to the future expansion and growth of the world economy.

SPECIAL **REPORT**

Greatest risk in resource sharing: technology

By Gautam Gupta
Special to CW‡

"Networking" has been a boon to buzzword bards and jargon generators for more than a decade. Today end users are lost in a forest of local-area networks, carrier-sense multiple access with collision detection, token passing and ring topologies.

This networking problem has become more acute with the spread of microcomputers to managers and professionals who operate without a technical training base. The problem is best defined as resource sharing, rather than, in jargonese, as networking.

In this environment, how can end users assess the risks and costs of resource sharing and select a product appropriate for their needs?

How can multiple users economically share valuable computer resources? The resources that could be shared are fairly straightforward. One resource, for example, is data stored in files. Through networking, different users can conveniently access this data.

Thus, the needless replication of data for each user or application can be avoided. Hardware devices are also resources that are commonly shared by a number of users. It would be wise to share, for example, letter-quality printers and Winchester disk drives, the cost of which is often in excess of the cost of the basic microcomputer.

The greatest risk in selecting a resource sharing product is technology. Today there are no standardized resource sharing products. The multiplicity of vendors spawned by the rapidly changing computer hardware environment — mainframes to minis to micros — has made such a standard elusive.

End users should look for a resource sharing product designed to minimize organizational and operational changes needed to implement resource sharing. Because these changes bear significant costs, do not select a resource sharing product that alters the microcomputer environment just to fit a so-called standard. With some investigation, a product that most easily fits the existing framework can be found.

End users should examine whether the product was expressly designed for microcomputers. Products that have been a blessing for mini and mainframe resource sharing have not been designed for microcomputers.

Extrapolating risks great

The risks in extrapolating what works in one computer environment and applying it to another are great. Remember, what is cost-effective for mainframe and minicomputer resource sharing systems may be expensive for microcomputers.

It is risky to embark on a broad-based resource sharing system. Gradual implementation of resource sharing on a trial basis has had good results. Because resource sharing requires significant changes, starting small minimizes the surprises.

The most obvious costs of implementing a resource sharing system are the product costs and the additional costs for wiring and cabling. Additionally, while some resource sharing products also serve as managers of the resource sharing system, others require dedicated servers.

A dedicated server is a microcomputer that has been selected to act as a resource sharing traffic director. It will no longer be available as a workstation. This opportunity cost must be factored in.

First, when examining a resource sharing product, consider the resources the system will support. Disks and printers are commonly shared, but also consider gateways and communications devices to other networks. Gateways are, for example, modems for communication via telephone and micro-to-mainframe communications capabilities.

Does the resource sharing vendor have these other products as part of his product line? If he does, then one-step support and compatibility are guaranteed. If he doesn't and he promises compatibility with multiple vendors' products, then think twice.

By choosing a vendor that offers a broad, fully integrated product line, the risks of resource sharing are reduced. And, more importantly, the resource sharing product may be easily upgraded to meet increased needs due to growth. The ability to upgrade is a basic tenet that should always be kept in mind during the selection process.

Second, user access should be examined in the resource sharing system. File locking, which governs a user's access to files, can be divided into two levels. On one level, file locking is necessary for setting up arbitration logic within resource sharing. This feature is used to delineate who has access to files first, second, third and so on.

The other level of file locking is necessary for security purposes. All files should not be available to all users. A resource sharing product

See SHARING SR/6

NETWORK from SR/3

work is one involving a dedicated path. Point A communicating with Point B, for example, has a dedicated path through the network where the data is transmitted, and nothing is done on the traffic itself. But A can, in fact, establish a connection between different points in the network. Once that is established, data flows directly on that path.

Packet switching, however, changes the concept somewhat. With packet switching, the same connection from A to B forms a virtual, not a dedicated, path. The facilities are not dedicated to that particular connection. Instead, bandwidth is allocated when data needs to flow from A to B, and packets of information move between those particular nodes from

Network characteristics

the origin to the destination end points. Packet switching also allows for network load sharing. If a node becomes congested and slows response time, alternate paths through the network can be utilized to ensure fast response time.

One of the key elements in the networks of the '80s is session switching. Session switching is an extension of the terminal line-switching concept. Where there are multiple devices on a circuit, session switching allows each individual device to have a particular path through the network. As a result, one terminal on a particular line can talk to one application, while another terminal on that same line can talk to a different application.

Another development in the networks of the '80s is satellite networking. One of the key elements in networking is the continually high demand for bandwidth between multiple locations, and the satellite capability is providing for a more economical method to provide that bandwidth. It is another form of communications that in certain environments provides an economical implementation of long-haul communications.

Groenke is vice-president of development at NCR Comten, Inc., St. Paul, Minn.

SHARING from SR/5

should accommodate restrictions on file access.

Additional security features to look for include the use of passwords, the ability to create private files, the ability to divide disks and record locking. A record-locking feature can help improve system performance. Two users can access the same file, but use different records.

Vendors making claims of strict record locking should be closely examined. The structure of some microcomputer operating systems prohibits record locking.

Discern whether it is through changes in the application software, not the resource sharing software, that record locking will be implemented. Manipulating an operating system to accommodate a record-locking feature can lead to future systems incompatibility.

Third, when assessing a resource sharing product, examine the language interface. Is the language of the resource sharing system an easy-to-use extension of the system commands already in use? Or will the resource sharing product require its users to learn an entirely new interface language?

Fourth, don't be overly concerned with promised transmission speeds when examining a resource sharing product.

Instead, be concerned with functional speed. Keep in mind how fast the microcomputer currently transfers a file to a printer or disk.

If a demonstration of the resource sharing product is available, assess system response time. Then apply that to the environment in which it will be used. A good resource sharing product should not perceptibly slow down the microcomputer's functional speed. Forget about theoretical claims, and look at system performance.

With these risks and benefits in mind, a resource sharing product can be selected wisely. The added value of utilizing resource sharing will undoubtedly lead to a more productive and, therefore, a more competitive business.

Resource sharing, if properly chosen, can be the boon to business that it has been hailed to be.

Gupta is president of IDE Associates, Inc., a designer and manufacturer of a line of peripherals for the IBM Personal Computer and Personal Computer XT.

SPECIAL REPORT

Some users opt to base local net on PBX

By Gary L. Alpert
and W. Edward Woods Jr.
Special to CW

A common question asked by many organizations is "What is my best choice for local-area networking?" Unfortunately, in many cases organizations do not effectively examine and define their true needs before making a decision. Quite often, networks are established and then only after the die is cast are user applications examined and actual data communications needs clearly defined.

The advent of local-area networks has been primarily spurred by the needs of staff professionals and managers. Thorough answers to a few key questions can greatly change the makeup and often reduce the cost for a fully effective local-area network. These questions include:

- Is the data to be accessed located on the mainframe computer, another user's microcomputer or a public data base?
- How often is the data accessed, for how long, by how many users and to how many devices?
- Are the communications requirements primarily from user to computer or user to user?

Staff professionals and managers require access to multiple caches of information, regardless of the type of computer device that contains the information. They are often part of the personal computing explosion, using personal computers for information gathering and manipulation. This data for decision making is contained in many computers, and greater speeds are required for file transfer of such documentation.

One type of local-area network that is receiving increasing support is that of the digital private branch exchange (PBX). Why such increased popularity? First, organizations have seen the efficiencies of owning their own telephone and communications systems.

Most presently being purchased and installed are purely digital due to their obvious benefits, and the cost of adding data communications hardware and software is usually quite reasonable.

The leading-edge vendors can provide connections at a cost of $500 per asynchronous device and $900 per synchronous device, which compares quite favorably with a connection cost for a broadband or baseband coaxial network. Broadband networks require a fixed-frequency or frequency-agile modem, and baseband networks also require a specialized interface such as the transceiver in the IEEE 802 or the Xerox Corp. blue book Ethernet specification.

Added to the cost per connection in such a network is the coaxial cable cost, which can be anywhere from $2 to $7 per foot. With a digital PBX local network, the cost of the twisted pair is usually absorbed with telephony installation, which runs about 20 cents a foot per twisted pair.

In addition, most digital PBX connections for terminals and computers only require an accepted electrical interface such as RS-232 and RS-449 providing level-zero transmission compatibility with almost any vendor.

Some PBX vendors with purely digital systems enable transmission over the same wiring simultaneously with voice. Signals are transmitted in some manner of statistical or frequency multiplexing along with voice and control signals.

Other vendors transmit over a dedicated pair for data transmission, using one pair for transmitting data and one for receiving data.

What other benefits can PBXs provide to the data communications user? Certainly, in a large terminal or personal computer environment, with a need to access multiple host computers, there are many benefits in the area of contention and controlled user access.

With leading PBX technology today, if all ports are busy on a CPU, users can queue for an available port, and the PBX will signal the user when it is available. An organization can even set priority access levels for users waiting in queue; for example, a casual user would perhaps have a lower priority access level than a vice-president of finance.

In addition, users from outside the organization can dial into modems attached to the PBX and receive the same user interface from the PBX's data communications software as an internal user.

A great many statistics are provided in the leading PBX data communications packages which allow an organization to administer details of who was on-line, with what, for how long and so forth.

In the '80s, the growth of digital PBXs and personal computers will drive PBX manufacturers to provide value-added services to their data products offerings. Devices in the area of protocol conversion, network gateways, electronic mail, file and electronic (laser) print services will be developed.

Many leading vendors already pro-

- See PBX SR/12

SPECIAL REPORT

Networks steer mover through deregulation

Connect agents nationwide with computerized information

ST. LOUIS — Like many companies caught in the deregulation crunch, United Van Lines, Inc. is easing the transition by implementing new high-technology products into its operations. A major part of its strategy is the integration of two different data communications networks to handle the flow of information from its headquarters here to its family of agents scattered across the country and around the world.

United Van Lines has combined the services of a public, value-added satellite network with its own private network that uses leased telephone lines. This helps its agents in their efforts to win new shipping business and keep shipments in progress running smoothly.

"By opening up the moving industry to competition based on price, the Motor Carrier Act of 1980 put us nose to nose with the strong forces of an unrestrained market," said Bob Baer, president of United Van Lines. "This challenged us to be more flexible in our rates and services while still maintaining quality service. It also forced us to be more prudent in controlling our costs."

One of the largest movers of household goods in the world, United Van Lines was formed as a cooperative association to serve the needs of a large network of agents, 600 in the U.S. and 500 internationally. Agents are owners of their respective moving companies, but depend on United Van Lines to assist them in servicing clients who wish to ship from state to state and country to country.

Although service takes on many forms at United Van Lines, according to Jim Beacher, vice-president of information services, "The change in the regulatory climate has put the need for information at the top of the list.

"Agents looked to us to provide them with creative strategies to compete in this new marketplace," Beacher explained. "We responded by devising innovative programs built on information, in operational areas such as job pricing, accounting and billing, mileage verification, shipment tracking and claims handling. These are parts of the business that play a big role in winning new business and delivering quality service."

With these programs in place, Ellie Sirota, manager of telecommunications, undertook the task of making this information accessible to agents on-line at a minimal cost. However, her options were limited due to United Van Lines' particular communications protocol. There is a wide variety of computer protocols, and not all are addressed by every data communications network, she said.

"When we went shopping for a network in the spring of 1982, [RCA Cylix Communications, Inc.] contacted us to arrange a test," Sirota said. "At the time, however, [its] network did not address our technical needs of an IBM Synchronous Data Link Control [SDLC] protocol." As a result, United Van Lines chose a private network based on leased lines to connect its agents with computerized information located here.

The RCA Cylix Communications Network added SDLC to its network in September 1982. "A month after I learned of this," Sirota said, "we tried using RCA Cylix to transmit registration infor-

See MOVER SR/14

SPECIAL REPORT

Bus networks gaining on traditional star nets

By Patrick St. Georgeade
Special to CW3

One trend that is becoming apparent is that data networks that are used in a local environment — a single building or a multibuilding campus — are beginning to take a different direction from in the past. That direction is toward bus networks and away from the traditional star configuration.

The bus networks offered today fall into three catego-

Star network

ries using two types of media: either shielded, twisted-pair lines for low-speed, low-cost requirements with total bus speeds up to 1M bit/sec; or coaxial cables for medium-speed (2M to 10M bit/sec) and high-speed (10M bit/sec) networks. The shielding afforded by these media provides excellent protection, and individual port speeds can range to speeds up to 60% of the bus speed.

Although it is difficult to fault proven equipment, it is also difficult to justify 10-year-old technology that is used in today's centralized data switches or port selec-

Bus network

tors. Similarly, it is difficult to justify the need for limited-distance modems when communicating further than the standard RS-232 distance of 50 ft over twisted wires, with the inherent possibility of line errors and electromagnetic interference problems.

Rarely can individual port speeds exceed 19.2K bit/sec. The cost or the inflexibility, or both, just do not meet the modern-day requirements to connect low-cost, intelligent devices that vary widely in interface needs, data rates, flow control, bit configuration and even protocol.

The new direction is toward intelligent local-area networks, where the intelligence is distributed throughout the network rather than at one vulnerable site. Therefore, failure at any one site does not cause the failure of the entire network. And with intelligence being distributed to the point of interface, the node can handle the characteristics of the device located at each site.

The power of a microcomputer operating system in each node allows the network to become almost device-independent so that changes in brands of terminals, computers or peripherals allow the network to remain intact.

The centralized switch or port selector system has a port cost that usually exceeds the cost of the dumb terminal that is connected to it. Yet, the network adds no intelligence to the device, but merely provides an electrical transport between a terminal and a host computer port.

With the intelligent networks that are being offered today, there is an operating system at each device interface node which adds intelligence to the device so that flow control can be selected; printer formatting (line feeds) can be handled, as well as character formatting,

See BUS SR/14

SPECIAL **REPORT**

Firm installs private satellite net

DALLAS — Communications managers and management information systems directors nationwide are faced with the burdensome responsibility of providing their organizations with efficient, manageable data communications systems at a cost-effective price. A data services firm here established its own private satellite network.

Electronic Data Systems Corp. (EDS) provides integrated data services to clients in the financial, insurance, health care, retail, manufacturing and higher education markets. The firm is a major supplier of such services to the federal government. EDS' local data processing systems are interconnected with larger, geographically dispersed computer centers, forming an internal network the company calls Edsnet.

"In order to design, integrate and operate systems of this size," explained Dr. Clairborne H. Johnson Jr., director of technical development for EDS, "available and reliable data communications are imperative, both for our customers' operations and for services EDS offers."

To help meet its data communications requirements, EDS embarked upon the installation of a private network of satellite earth stations manufactured by Vitalink Communications Corp. of Mountain View, Calif. Vitalink provides intelligent earth stations, satellite transmissions and network program management.

EDS has completed the first phase of its network migration by installing three Vitalink earth stations between its three major data centers in Dallas, Camp Hill, Pa., and Sacramento, Calif. The Dallas site has a 9-meter, Dual-Trac earth station capable of a maximum throughput of 6M bit/sec. Camp Hill and Sacramento each operate with 7-meter stations expandable to 4M bit/sec. The EDS network is expected to quadruple in bandwidth and number of locations over the next two years.

Edsnet uses a combination of Vitalink satellite earth stations for the backbone of its network and terrestrial tail circuits to connect customer sites with EDS' regional satellite nodes. Vitalink's current generation of products enables an interstate private line of 56K bit/sec or greater to be replaced with a Vitalink network. EDS has replaced two lines between Dallas and Camp Hill and one line each between Dallas and Sacramento and Sacramento and Camp Hill. "The real payoff in switching to satellite communications," Johnson emphasized, "is in the benefits to quality and performance."

EDS' business communications must be ultrareliable and flexible enough to respond to both its customers' and its own internal network requirements. This flexibility includes being able to add bandwidth to the network or add service to a new account in a very short period of time.

The network must come as close to continuous operation as possible because outages can cost both EDS and its customers significant financial losses. For example, certain of EDS' U.S. Department of Defense contracts specify the mandatory provision of redundant data centers and communications facilities. Furthermore, there are many applications, such as videoconferencing, which require a large amount of bandwidth for a relatively short period of time. "For these reasons," Johnson said, "we determined that satellite communications was the only way to construct the kind of network we needed."

At the heart of the EDS network is the intelligent, microprocessor-driven earth station. To maintain reliability, each station is manufactured under an integrated system design with solid-state, modular components.

There are two complete and independent data paths operational in each station and through the satellites as well. In the event of a failure in any single earth station component, that network location loses only one-half of its data communications capability. The other half of the earth station remains in full operation. "This allows us to provide redundancy where required without the addition of duplicate circuits," Johnson explained.

In the event of a problem in a station, a built-in network monitoring system automatically diagnoses the condition, sounds an alarm and notifies Vitalink's Network Operations Control Center via an autodial modem in each station.

See EDS SR/12

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EDS from SR/10

"By setting the proper performance windows in each of the 94 control points in each station we monitor, we can usually identify a problem before it affects the performance of a customer's network," said Michael Fegan, national account manager for Vitalink. "Then we instruct the customer to replace the problem part online while that earth station is still operating at one-half capacity."

Additional functions of the network software allow the user to route bandwidth dynamically through the network as required. For example, EDS can set up a large file transfer or videoconference at 1.544M bit/sec for an hour and then drop that application off the network, paying only for the actual satellite usage. Up to four user-programmed networks can be stored in the system to be activated on a time-of-day basis as business volumes dictate.

Because of the broadcast nature of the satellite, any new location added to the network via an earth station is automatically connected to all other sites. This allows for full-mesh connectivity at about the same cost as one high-speed, point-to-point terrestrial circuit. "This answered our problem of data center backup," Johnson said.

Financially, the investment EDS has made in the earth stations allows the company to control a greater portion of its network cost through one-time capitalization.

Furthermore, Vitalink offers its network services on a fixed monthly price for terms of 12 months or longer. "For the first time, we can accurately predict and control the costs of our data communications budget," Johnson added.

The strategic benefits that EDS expects to derive from a flexible, in-house satellite data network are seen to be key to its business. Johnson noted, "Our commitment to this technology is indicative of the increasingly vital role EDS recognizes that communications systems will play in the data services the company offers."

Edsnet

PBX from SR/7

vide asynchronous terminals with 3270 bisynchronous and pass-through emulation. Capabilities such as X.25 gateways, including X.29 padding functions, are also supported by leading vendors.

Agreements for joint cooperative work among microcomputer and mainframe manufacturers and PBX vendors have already been established.

The IBM purchase of 18% of Rolm Corp.'s stock last year could be construed as an endorsement that the digital PBX is the glue that binds workstations and resources in an office environment.

Many standards groups have started work on a digital PBX-to-mainframe interface, which will certainly increase the popularity of the PBX as the office hub for data communications.

In short, the era of the truly effective and flexible local-area network is just beginning, and the PBX can be expected to play a continually expanding role as more attention is directed to the real user and the real use. The technology will be available and waiting.

Alpert is a data applications consultant for the Tysons Corner, Va., branch of Rolm, and Worms is president of Office Technology Corp. of McLean, Va.

SPECIAL **REPORT**

Fiber optic's time has come in phone network

Offers advantages over wire line, radio systems

By Raymond White
Special to CW‡

Early technology forecasts predicted the widespread use of fiber optics in telecommunications applications. These forecasts have begun to come true. There are, at present, several trial or traffic-carrying systems in use in telephone operating company trunk and loop plants.

The use of optical fiber communications systems in the telephone network has advanced very rapidly since the first use of a fiber-optic T1 transmission system in 1977. Since then, both trunking and loop systems have been put into use carrying live traffic.

The use of fiber optics in feeder, interoffice or toll digital transmission systems can offer several distinct advantages over conventional wire line and radio systems:

■ Fewer repeaters. Fiber-optic systems can have repeater spacings exceeding 8 kilometers. As a result, most urban interoffice trunks can be repeaterless. Rural trunks would require fewer repeaters. This means lower installation and life-cycle costs.

■ High capacity for small cable size. Cables less than 2 centimeters in diameter have the capacity of several 10-centimeter-diameter wire line cables. This eases the capacity problem in overcrowded urban cable duct systems; old duct capacity can be better utilized to eliminate the need for expensive additional duct work.

■ Immunity to lightning-induced surges. The fact that the transmission medium is dielectric means that lightning-induced surges with their resulting damage to cable and electronics are no longer a problem.

■ Frequency allocation not required. With radio transmission, a long and involved licensing procedure is required in order to get Federal Communications Commission approval to operate the radio. Fiber optics is a high-capacity alternative that does not require such licensing.

Cost will be the ultimate deciding factor regarding the extent to which fiber-optic systems are used in transmission applications. Even with today's low-volume manufacturing costs, fiber-optic systems can "prove in" economically at medium to high capacities when compared with conventional systems.

The costs include typical installation and duct costs for urban installations. The fiber-optic link becomes less costly than the wire line link at a capacity of approximately 500 voice circuits. This result is typical of the comparative costs of fiber-optic and conventional systems.

Hence, fiber optics is a viable alternative to conventional transmission technologies, provided the system capacity is relatively high, above approximately 500 voice circuits.

Two technologies, which are beginning to emerge from laboratory development, will have a significant effect on the application of fiber optics to digital telephone transmission. The first — long wavelength transmission — will allow repeater spacings that rival those of radio systems. The second — wavelength division multiplexing (WDM) — will allow simultaneous transmission of several signals over a single fiber through the use of "color" multiplexing.

At long transmission wavelengths, both loss and dispersion in optical fibers are

See FIBER SR/15

MOVER from SR/8

nation on a new moving job between two agent sites — one in California, the other in Boston. The trial went smoothly. Confident that the network could save us money and help our agents deliver better service, I recommended the network to my colleagues."

Initially, only new agents were linked to the network. Sirota eventually implemented a program to convert existing agent sites from leased telephone line to satellite.

According to Sirota, the ability to save thousands of dollars in line charges is one of the main reasons United Van Lines decided to go with RCA Cylix. "Leased-line service is very expensive for us because it is billed on the basis of distance rather than volume," she noted. "We have agents all over the country, so you can imagine the cost of linking everyone to the network.

Those agents already on the satellite network are enjoying the benefits of accessing information on-line without the assistance of an operator. This allows them to provide quicker responses to a shipper's queries concerning equipment availability, shipment location and freight estimates.

Those agents already on the satellite network are enjoying the benefits of accessing information on-line without the assistance of an operator. This allows them to provide quicker responses to a shipper's queries concerning equipment availability, shipment location and freight estimates.

"The ability to supply accurate, competitive estimates can be the difference between winning and losing a prospective shipper's business," Sirota said. "This process was relatively uncomplicated under regulation because rates were set by law. Open market pricing has made things more difficult. Now, agents must compile estimates by calculating various mathematical ratios involving a shipment's weight and destination.

"United Van Lines has simplified this procedure with a proprietary software package that assists agents in their calculations. Using the satellite network, agents can access this automated mileage guide on-line to deliver an accurate freight bill quickly," Sirota said.

Since last June, the satellite network has steadily made its presence felt throughout United Van Lines' entire agent community. With 35 remote sites on the network already in place, the network equally shares the responsibility of distributing operational information with the leased-line network.

BUS from SR/9

speed adapting and many more features. The dumb terminal is no longer dumb. And none of these devices has drawn upon the operating system of any computer attached to the intelligent network.

When comparing the total cost abilities of the star network (central switch) vs. the bus network (distributed switch), it is important to consider:

- Higher hardware costs (redundancy, line drivers and so forth).
- Higher installation costs (greater distances of wire).
- Higher expansion costs (wiring and line drivers).
- Total system reliability questions.
- Some limitations of type of I/O devices.
- Higher cost of transmission media per foot.

With the simplicity of stringing a single-bus cable in a building, attaching switching intelligent nodes where desired, the whole networking concept becomes easy — easy to install, operate and expand.

Bourgeois is vice-president and director of marketing for Complexx Systems, Inc. located in Huntsville, Ala., a manufacturer of data communications equipment.

FIBER from SR/13

reduced relative to the loss and dispersion of so-called short wavelengths. As a result of improved transmission characteristics, link length or repeater spacing can be dramatically increased.

The technology of WDM allows the combination, transmission and subsequent separation of several different optical signals each of a slightly different wavelength. WDM, combined with the very large bandwidth of optical fibers, makes possible very high-capacity cables using only a few optical fibers.

For example, if WDM was used to combine 10 duplex signals onto a single optical fiber, a capacity of 40,320 simultaneous two-way telephone circuit would result. The technology to accomplish that will be available in a short time. Multiple wavelength systems are today being demonstrated in the laboratory. The advent of integrated optics will make such systems even more practical.

While fiber-optic trunking systems are a practical reality today, fiber-optic subscriber loop systems appear to be a few years off. One major telephone company (Bell Canada) has predicted that fiber loops will be economical by 1986. There are, however, several major trials being conducted. Among the more prominent are the Bell Canada Yorkville trial, the Manitoba Telephone System/DOC Elie trial and the Japanese Hi-Ovis experiment. Fiber-optic local loop systems are attractive for several reasons:

- Broadband capability. Fiber-optic systems have such a large bandwidth that they are capable of transmitting multiple services, including voice, video and data signals. Fiber optics is the likely pipeline that will be the key to future "wired city" broadband systems. However, it should be pointed out that there are political and social considerations that could delay single-pipeline broadband networks.
- Ultimate low cost. The rising cost of copper, coupled with the falling cost of optical fibers, indicates a crossover in cost some time in the near future. Furthermore, the fact that fiber-optic systems can carry more services than copper will mean a lower cost per service with the fiber-optic system.
- Immunity to lightning surges. Local fiber-optic systems would eliminate the need for lightning protection in the local loop.

One present-day drawback of local fiber-optic systems is that an alternative means of powering the telephone set is required. The approach considered most often involves the use of local ac power with a battery backup in the home capable of powering the telephone service for up to eight hours in the event of power outage.

The services provided by the system are:

- Multiple telephone and data channels.
- Broadcast, pay TV and educational TV.
- Library and information retrieval (so-called "viewdata" system).
- Entertainment audio programming.
- Fire, security and panic alarms.
- Meter reading and power shedding.
- Electronic banking and shopping.

Two technologies will have a significant effect on the application of fiber optics to digital telephone transmission. The first — long wavelength transmission — will allow repeater spacings that rival those of radio systems. The second — wavelength division multiplexing — will allow simultaneous transmission of several signals over a single fiber through the use of "color" multiplexing.

- Subscriber-originated video for business conferencing and video games.
- Opinion polling.

Cost studies using computerized parametric analysis have been carried out for the system. An estimated cost per subscriber for a system serving 100,000 subscribers is approximately $700 to $800 per subscriber, which is reasonably attractive, especially considering the variety of services provided and the flexibility of the system.

The results given in the foregoing discussion indicate that:

- Fiber-optic trunking systems are cost-competitive today while offering users several other advantages.
- Future technology developments will make fiber-optic trunks even more attractive.
- Local fiber-optic broadband systems can provide moderate-cost, flexible-service networks.

What remains for the future implementation of such systems is political actions and social acceptance. It can certainly be said that fiber optics is a technology whose time has come as far as application in the telephone network is concerned.

White is manager of West Coast systems for the Recon and Surplus Lines Division of Cigna Corp., an insurance company located in Los Angeles.

SPECIAL **REPORT**

State moves to organize independent nets

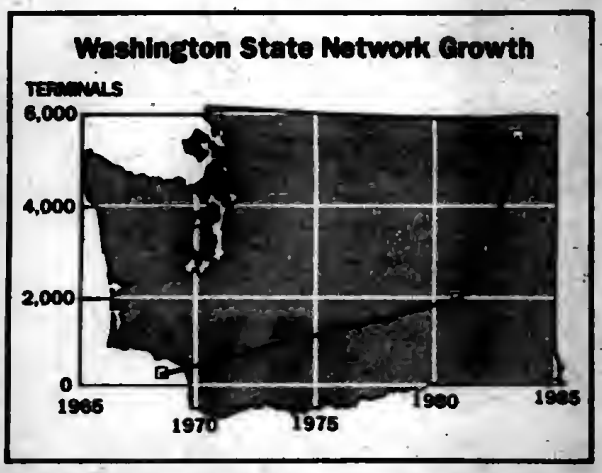
For optimal use in decentralized management structure

By Dennis Jones
and John Flanagan
Special to CW

Today, Washington state government is poised on the threshold of a new era in telecommunications. New responsibilities for end-to-end network management, new competitive environments for acquisition of hardware and facilities, new service offerings such as electronic mail and a confusing new array of vendors and rates are but a few of the challenges that must be faced. Washington state's confidence in its ability to meet the future is founded on a cooperative organizational concept, structured to meet these coming challenges.

Long before the court-ordered Bell divestiture became an issue, Washington state government recognized the need to bring order and efficiency to its communications networks. In the 1960s, the pressures for improvement seem to have grown at an exponential rate, paralleling the state's growth in telecommunications. (Currently there are about 6,000 remote terminals installed on Washington's networks, and these are doubling every two years.

The demand seems unrelenting as terminals and microcomputers spring up in government offices throughout the state. Income assistance determination, criminal offender tracking, determinant sentencing, business licensing and college class scheduling are just a few of the state's programs where interactive computing is being demanded for improving services to citizens.



Administrative systems such as accounting, budgeting, personnel and payroll have also gone on-line to streamline management control. In addition, increased computer literacy among government workers is bringing demands for electronic mail, electronic document distribution and shared access to various data bases.

While almost everything involving telecommunications has seen dramatic changes over the past decade, Washington's decentralized network management structure has remained intact. In the past, with few exceptions, various Washington state agencies and institutions have independently planned, implemented and operated their own data communications networks.

There are at least 20 significant independent networks in existence. The most frightening aspect of this is not knowing just how many networks there really are.

The severity of the current situation can be illustrated with examples such as the government offices in the city of Wenatchee, Wash., which are linked individually to 12 different state networks.

It is clear from the description of Washington state's networking structure that many of the fundamental problems may be attributed to the decentralized data processing management.

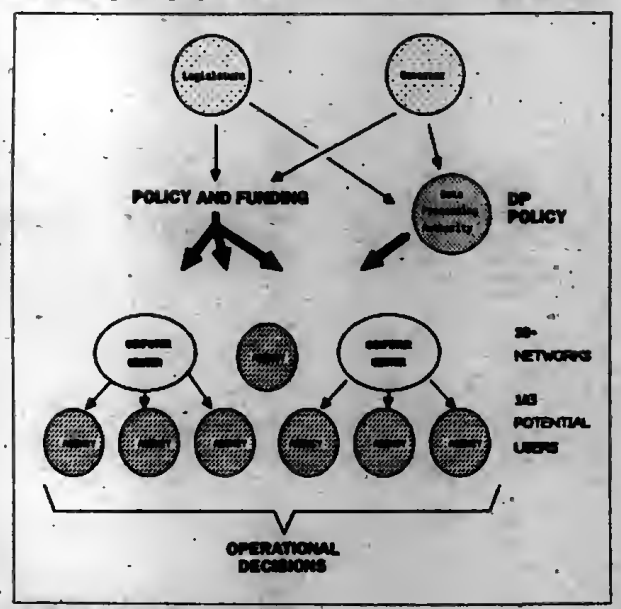
While this structure may complicate and confuse the optimization of resource usage (be it networks, systems or staff), it does provide agencies with direct control and simplifies the application of information processing to their business problems.

The challenge facing Washington state is not how to organize for optimizing network resources, but how to organize the network for optimal use in a decentralized management structure.

The focal point of this challenge is the state's Data Processing Authority (DPA). Created in 1973 to provide for the efficient and effective use of data processing in state government, this board consists of 11 members — seven state government executives and four private sector executives — and is supported by an executive director and eight professional staff members.

Traditionally, the DPA had concerned itself with control over the proliferation of computer installations. By the 1980s, the DPA's early achievements of consolidated computer centers and close control of acquisitions seemed less important. The new demands for resource sharing (systems, data and networks) and resource optimization appeared attainable only through some massive

See STATE SR/18



Washington state network organization

SPECIAL REPORT

Local nets spur evolution to distributed DP

By Ralph H. Hagemann
Special to CW

Local-area networks have captured the imagination of the computer user community — with good reason. Local-area networks provide the necessary links by which microcomputers, minicomputers and large mainframes can be interconnected with one another and with other information-processing devices into a cohesive system where vital information and expensive resources can be shared. Fueling the heightened interest in local nets is the proliferation of powerful but relatively inexpensive personal workstations.

The evolution in computing has been away from large central computers and toward smaller application-specific systems. A recent Data Decisions, Inc. survey found that data processing managers look to microcomputers to improve managerial or professional productivity, reduce mainframe work load and provide faster access to data. Increased experience with computers, an attendant benefit, was also cited by DP managers as an avenue to future productivity increases. Clearly, distributed information processing using microcomputers will play a vital role in the future.

The most visible sign of this movement from centralized to distributed information processing is the number of personal computers installed in offices throughout the U.S. Though only 7% of the office workers in the U.S. had a personal computer at the end of 1983, an estimated 40% will be using a personal computer to access information by 1990. The personal computer revolution that we have been hearing about for the past five years has merely begun. In the near future, these personal computers will not only share information among themselves but will also easily and transparently be able to obtain information from and enter information into centralized data bases such as mainframe computers.

Local-area network technology allows very high communications bandwidths to be implemented economically, with data rates typically from 1M bit/sec to 50M bit/sec. This bandwidth is essential if large numbers of stations are to be accommodated, and it is vital for increasing user productivity when moving files between workstations and centralized data bases.

This technique contrasts with the conventional private branch exchange (PBX) or data switch approach of dividing bandwidths simultaneously among many slower speed transmissions. In addition, local-area networks use distributed communications processors rather than centralized processors, providing the dedicated intelligence needed to interconnect specific devices. Because local-area networks and PBXs solve different communications problems, they will continue to coexist for the next several years.

Currently, over 16,000 local-area networks of all types are installed worldwide, with 66% of these in the office. By the end of 1988, the number of local-area networks installed is expected to reach more than 100,000. This expansion is mirrored in the growth of local-area networking systems suppliers both in total number in the marketplace and in the size of each individual supplier.

Local-area network technologies come in many shapes, sizes and levels of capability and are offered by an equally broad range of vendors. As a result, two local-area network markets have emerged: proprietary computer systems and vendor-independent communications systems. The latter market can also be divided into three segments: namely, personal computer clusters, mainframe computer room networks and general-purpose networking systems, which incorporate aspects of both micro-to-micro and mainframe-to-mainframe networks.

The size of the general-purpose local-area network market will exceed $150 million this year and will at least double annually for several years. Thus, the market may well be in excess of $1 billion by 1987. This market, though large, will not be big enough for computer vendors to abandon their proprietary approach to local nets, however.

Because such diversity exists in the local network environment — from physical interfaces to data exchange management — it will become increasingly important that international industry standards be established. The development of such standards not only provides the basis for increased compatibility among many vendors' products, but also significantly lowers the cost of local-area network products since industrywide semiconductor implementation is possible. Moreover, customers need to know that a network installation is a long-term proposition, capable of serving tomorrow's communications needs as well as today's.

Much of the industry discussion about local nets has centered on what

See GNSW SR/18

STATE from SR/16

reorganization toward centralized management and leadership.

In 1982, after consideration of other options, the state chose to continue with the decentralized data processing management structure. This new method of operation relies on three key principles:

■ Deal with a few specific addressable issues at a time, making use of subcommittees to deal specifically with the issues.

■ Involve top data processing executives and staff from state agencies in the process of identifying these issues, defining goals, establishing objectives and developing solutions.

■ Place greater emphasis on planning and leadership, while de-emphasizing some regulatory and control responsibilities.

Over the last year, three significant elements of the architectural strategy have been developed that have led to a clearer picture of Washington's net organization.

The first element is the definition of primary nodes. Nine major data processing centers have been designated as the primary nodes in the statewide data network. (Communication links do not exist at this time among all primary network nodes, although several service centers have taken the initiative to create some of these links.)

Secondly, each state agency has been assigned to one of these primary nodes as the agency's primary link to the data communications network. As the network plan is developed, it is expected that the definition of communications standards between agencies and their hosts will be simplified.

Lastly, the expected benefits and merging technologies indicate that voice and data telecommunications must be addressed simultaneously.

Although the definition of these elements is important, there are many more complex issues which must be resolved. The plans for the next step of requirements definition, planning and design are now being finalized. Among the issues to be addressed in this next step are:

■ Network management. Will a common statewide network be managed by a single state agency? Should network management services be contracted out?

■ Services required. The scope of services provided by a common network may vary from simply providing least-cost circuits to providing a variety of value-added services like gateways and protocol conversions.

■ Private vs. public transmission systems. Should the state establish its own telecommunication circuits in the high-density corridors? (In 1982, there were 534 circuits for voice and data between Seattle and the state capital in Olympia.)

Jones is the assistant director of the state of Washington's Office of Financial Management. Flanagan is senior data processing coordinator for the state's DPA.

GROW from SR/17

transmission medium should be used — broadband (multiple channels) or baseband (single channel) coaxial cable or fiber-optic cable. The major growth in 1984 will be seen in broadband, which by the middle of 1984 is expected to represent almost 50% of the market.

If, as anticipated, IBM uses data-grade twisted pair for its local nets, we can expect to see this medium rapidly gain industry acceptance as the dominant medium for the next few years. Fiber-optic-based local nets, in their infancy now, will ultimately become the most common, because they offer extremely high bandwidths together with resistance to electrical interference.

In 1984, local nets will be even more widely used to implement effective distributed information processing. Providing long-term integrated local-area network solutions will require that corporate-wide networks utilize several media, be capable of interconnecting all equipment — regardless of vendor — and support international standards. Thus, adherence to international standards will become a key issue in the upcoming year.

Ungermann is president and chief executive officer of Ungermann-Bass, Inc. of Santa Clara, Calif.

SPECIAL REPORT

Worldwide E-Mail program helps Ford share resources

DEARBORN, Mich. — To the businessman facing a deadline, nothing is more frustrating than the knowledge that his urgent message to a distant colleague is traveling at the speed of an office boy's mail cart. Or, that his rush telex may be 20th in line for transmission. Time zones and communications equipment differences magnify the problem for companies dealing worldwide.

Ford Motor Co., based here, is eliminating communications bottlenecks with a three-phase program based on electronic mail.

Faced with the need to tie together the efforts of U.S. operations and those of its foreign affiliates in developing automotive products with international market appeal, Ford is emphasizing a sharing of resources, exchanging ideas and engineering techniques, for example, to achieve high product quality while reducing development costs.

Implementing this kind of operating strategy on a world scale calls for highly effective worldwide communications — in Ford's case, a unified electronic mail system that integrates the majority of Ford's communications requirements and both simplifies and speeds the transmission of administrative messages, word processing documents, business reports and schedules.

Gerald L. Decker, manager of Telecommunications Services at Ford headquarters, said his department's objective is to build a user-friendly corporate electronic mail system that acts as a hub for all electronic mail activities within the company.

"Ford presently uses several different forms of electronic mail technology," Decker said. "Most are centered around a 'community of interest,' whose users need to communicate with each other on a regular basis. Our goal is not to replace local community-of-interest electronic mail systems, but to provide a means of information exchange among them."

Two years ago, the company replaced a private-wire teletypewriter network with the Worldwide Integrated Communications (Winc) electronic mail service. Winc is a service of Mohawk Data Sciences Corp. (MDS) of Paramus, N.J. Now, Ford users can transmit typewriter-quality documents at speeds of up to 2,400 word/min, in comparison with 60 word/min on the teletypewriter system.

"The new electronic mail network has resulted in annual savings in excess of $300,000 in equipment and services, as compared with the previous in-house network," Decker noted. "This is in addition to savings related to increases in productivity, something that at this point is evident, but has not been evaluated in actual dollars."

See FORD SR/20

FORD from SR/19

Ford is building a three-phase network. Phase I is an automatic electronic mail service that links 97 of Ford's factory and corporate locations in the U.S. and Canada with interconnection to international record carriers for worldwide message distribution.

Ford uses MDS message terminals and communications processors. Installed at strategic locations throughout the company, the terminals serve as message centers for employees in each vicinity. Terminals in the domestic network are controlled by the Winc operations center in Norwalk, Conn., a facility managed by MDS.

"Pickup and delivery of messages from these centers is automatic, requiring no operator involvement," said John Nepiuk, telecommunications specialist at Ford. Ford's electronic mail system could have accessed the public dial telephone network, but using existing voice lines rather than dedicated lines keeps the cost of the network low, according to Nepiuk.

In planning a corporate electronic mail system, Ford insisted on an open network concept. "The system had to be flexible," Nepiuk said, "allowing different types of terminals to access the network depending on each user's requirements. This is the primary focus of Phase II of the system, implemented in 1982."

Any standard communications terminal — a word processor, personal computer, electronic mail or buffered time-share terminal — can access the Ford network. Six different brands of word processors are presently accessing the network on a dial-in basis. In addition to normal business correspondence, letter-quality documents such as engineering reports or market analyses can be transmitted to Ford facilities around the world in a matter of hours.

Relating this capability to Ford's overall business philosophy, Decker said, "Electronic mail fits perfectly into our world-car-company strategy. The system enables a free-flowing dialogue to take place between our foreign and domestic operations, whether it be the sharing of technical information regarding research and development or correspondence between high-level executives." Mayford Roark, Ford's executive director of Systems, is a particularly enthusiastic user of the electronic mail system. Roark regularly uses both his office terminals and a terminal at his home to send messages to systems managers in the U.S. and overseas.

"Electronic mail is most useful as a replacement for the telephone call, which is time-consuming and expensive," Roark said. "Without interrupting or waiting for the other party, I can send questions or instructions to one manager and copy three or four others at the same time."

Since Roark composes much of his own correspondence, he spends little time dictating or revising. And, unlike the telephone, the electronic mail system gives him hard copies of all his messages.

Ford is preparing for Phase III, which will further enhance the use of word processors on the corporate electronic mail system. "Presently, our word processors are supported in a 'plain text' mode," Nepiuk said. "Because the word processing industry has not standardized on a common protocol and code set, transfer of documents between dissimilar word processors is limited.

"With the Phase III enhancement, we will have the ability to exchange text and document format control codes — underline, tab, page-number commands and so forth — between different models."

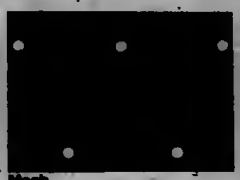
SPECIAL REPORT

Architects' plans should allow for data wiring

By James Hamilton
Special to CW

While there is still some conjecture about the automated office of the future, two things are relatively certain: It is not that far in the future, and it probably will utilize at least as many data terminal devices as the office of today does telephones.

Consequently, this affects — or certainly should affect — the architect's planning today. If the architect does not provide for a well-planned and effective data wiring system or local network in the budget for each building, the tenants may well be destined to work in a chaotic data communications environment.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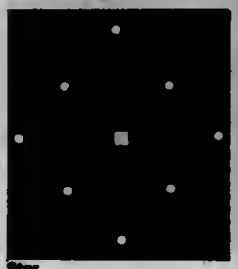
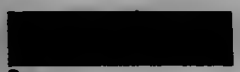

Star


Tree

A local-area network is the connection portion — wires, adapters and access protocols — of a system that makes possible the transfer of information between devices that are all located on the same premises. This could be an office building or portion of one, a manufacturing plant, hospital, university campus and so forth. The information will typically be carried on the network at speeds exceeding 1M bit/sec.

The devices linked in a local-area network may include a variety of information display stations, word processors, file and printer units, facsimile equipment, computer-graphics devices, video cameras and monitors, even whole computer systems, central systems or telephone switchboards.

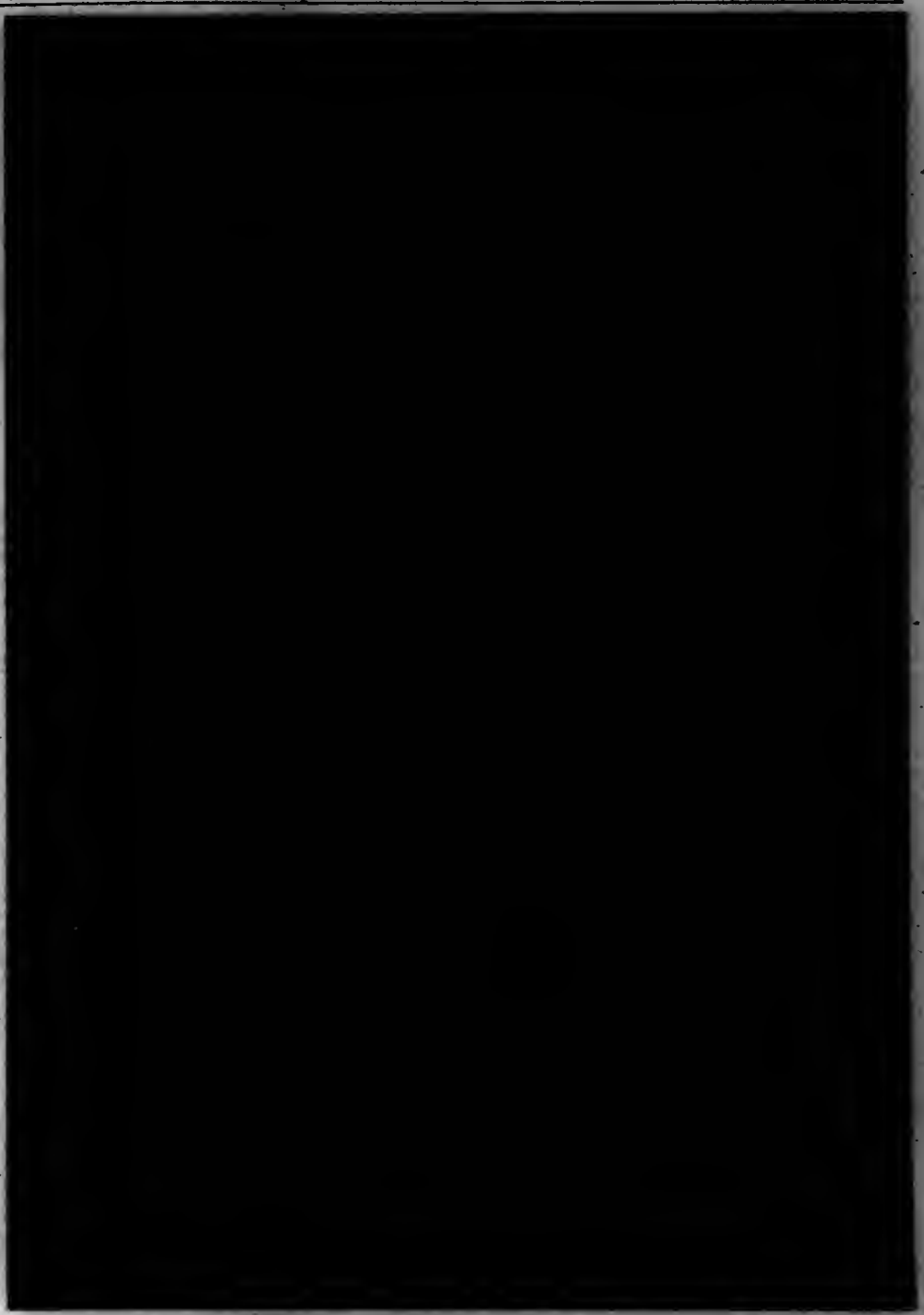
Obviously, the design of a local network and possibly its installation might require electrical engineering skills and electrical contractors. But it is up to the architect to include communications wiring needs in the budget and building plan if they are to become reality.


Bus

Why is it necessary to plan for data communications wiring? Whatever the outlook for the office of the future, the number of data terminals in the office of today

See WIRE SR/22


Ring



WIRES from SR/21

had been growing 25% to 30% a year, and a wide variety of these devices are now counted in the millions. Moreover, the number of terminals moved from one location to another ranges from 10% a year to 100% within six months and averages nearly 30% a year.

Until now, initial installation and movement of these devices has been a haphazard process. Consequently, a lot of cables that are no longer usable may still be installed and take up valuable and limited space. Individual cables may be unlabeled, and systems overall are not well documented. An existing cable is useless if the user does not know where both ends are. And, unfortunately, when a terminal is moved, a new cable must often be installed.

Up to the present, this approach has simply added to the maze of cables and their cost. But when the number of terminals reaches predicted levels, it will be a physical impossibility.

Consequently, modern, user-oriented data communications wiring requires the architect to plan for:

- As many wall outlets to plug in data terminals as the average office has telephone outlets today.
- A structure wiring approach for data communications, with wiring closets and a system of cross-connect panels similar to those employed for telephone communications to simplify installations, maintenance and change. This can be achieved either by using larger wiring closets to accommodate both data and telephones or by using a separate, adjacent closet for each.

This approach can potentially reduce the cost of a cable run to an office. It may allow the same cable to be used over and over for a variety of terminals, particularly when the wiring system is designed to handle several transmission systems which have wide use and will simplify movement of terminals within an establishment.

For example, if a department moves from the fifth floor to the eighth floor, its terminals will be unplugged on five, plugged into the wall receptacle on eight, and interconnections will be changed in the closets. There will be no cables to pull, hence little expense and time lost.

By contrast, if some firms want to make a major move in an existing building, up to six months are needed in order to get the required new cables installed.

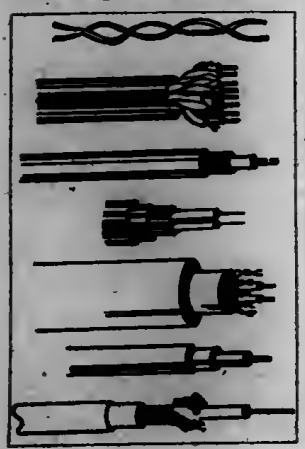
Naturally, the wire that must be installed to serve an individual terminal is the most expensive. In a building that has partitioned walls and removable ceiling tiles, it may cost $200 to $300 to install a new cable from the office to the computer room. But in an older building with stone walls, marble floors and old-fashioned ceilings, the cost can go up to $5,000. In contrast to pulling separate wires for individual users, it often costs much less per user to pull multiple cables at a time.

Eventually, the electrician or electrical contractor will be spared even that. The single-cable approach (not necessarily a single conductor) is the way local networks are evolving. The cable may include the familiar twisted pair or shielded multiple twisted pairs; coaxial, twin-axial and triaxial cables; mixed-media cable; and fiber optics. These cables will be linked in a variety of ways: star, mesh, bus, tree, ring and so forth. And in many instances, the architect may no longer have to design for, nor the electrician cope with, the volume of wires necessary in the past.

The newer communications wiring systems offer a user maximum flexibility, higher data transmission speeds, more channels with less noise and interference and the like. One goal of the architect should be to design or remodel buildings so that whichever local network the user ultimately adopts, the building design will facilitate the network's installation, maintenance and alteration.

Some of the factors to consider in

See WIRES SR/24



SPECIAL REPORT

Net turns broker bullish on communications

PITTSBURGH — As a highly successful investment management firm located here, Federated Investors, Inc. knows the importance of planning for the future. It also knows that having ready access to the right information at the right time is vital to itself and its clients. For these reasons, the company made expandability and accessibility the main priorities when it decided to implement changes in its computer system.

Expandability was important because Federated was growing at a rapid pace. Over a period of three years, the company grew from approximately 65 to over 750 employees. During that same period, monies under management went from $2 billion to $31 billion. Because this expansion was expected to continue, it was essential for Federated's computer system to be able to handle continually increasing data processing requirements.

Accessibility was important because Federated and its clients depended upon the data processing capabilities of the resources and the information these resources contained.

Federated wanted a system that could readily provide it with access to the knowledge it needed to continue to serve the interests of its clients.

Of these two priorities, accessibility was a more complicated, though not necessarily more important, problem. System resources and users were widely dispersed. In addition to 12 Tandem Computers, Inc. T16 Nonstop II CPUs and an IBM System/34 in here, Federated accessed an Amdahl Corp. host in Kansas City, Mo., and an IBM 4300 in Blawnox, Pa., a town about 20 miles outside of Pittsburgh. The users of these resources included over 1,600 clients around the country and Federated personnel in three buildings.

Achieving accessibility was further complicated by Federated's use of equipment from different vendors and its separate asynchronous twisted pair and synchronous IBM 3270 coaxial systems. System incompatibility in this multivendor environment caused applications to be bound to a particular terminal family and denied some users access to all the resources. A number of other users needed two different terminals to perform all their job-related tasks.

The addition of new computers and terminals would be a step toward addressing Federated's growing needs, but it would not address the problem of accessibility. Neither would it be a very cost-effective solution, especially over the long term, since the cost of equipment and new cabling could quickly get out of hand.

The fundamental need, therefore, was seen to be a cost-effective method of integrating widely dispersed and different data devices into a readily accessible data communications network that could handle future growth.

Three goals

To create this network, Federated concentrated on three things: linking the separate systems, providing users with the ability to switch among the computer hosts and minimizing the need for additional equipment and cabling facilities.

Federated accomplished these goals by installing Akusthus Data Communications Corp. C-80 protocol converters, Gandalf Technologies, Inc. Line Miser data-over-voice, two-wire local modems and a Gandalf Dual Pacx IV data private automatic branch exchange. The protocol converters make the synchronous systems accessible from Ascii terminals, and the Line Misers provide data service to Federated personnel over existing telephone lines. Both help to maximize the use of existing terminal and cabling facilities.

The key to integrating the network, however, was the Gandalf Pacx, through which everything was routed. The Pacx allows a terminal user to switch among the various resources, which are grouped by classes. Users access any resource by asking for a particular class of service.

Before the installation of this equipment, Federated's system was relatively complex. Synchronous terminals in accounting accessed the System/34 over direct coaxial cable links. Asynchronous terminals in various other internal departments accessed the Tandem CPUs over direct links or used Infotron Systems Corp. multiplexers when cabling considerations dictated.

Also interfaced to the Tandems were Digital Equipment Corp. LA34 keyboard/printer terminals in 1,300 financial institutions around the country. These devices accessed the CPUs via an X.25 packet-switched network. The institutions used the terminals, which comprised Federated's "edge network," for such investment transactions as the purchase and redemption of Federated's money market funds.

The IBM 4300 host in Blawnox, on which Federated bought time, was used to develop application software. The Amdahl host in Kansas City,

See LINK SR/24

LINK from SR/23

which was accessed via 3270-compatible modems and Four Phase Computer Systems, Inc. 3274 controllers, was used for shareholder accounting. Approximately 120 terminals were interfaced to the controllers by coaxial cable.

Most of the terminals interfaced to the Amdahl host were in account administration and bank services. These departments used the terminals to access on-line inquiry updates of client accounts. Bank services also had eight asynchronous terminals which provided access to the Tandems. The asynchronous terminals were used to enter data for those financial institution clients that did not have edge network terminals.

Although this system adequately served Federated's needs, there were two problems. The first was that the system was actually four separate systems. The second problem was that a larger user base for any or all of the separate systems required more terminals and computer ports. In addition to the expense this would involve, there would be the expense and trouble of pulling more cable to install the equipment.

With the solution Federated opted for, however, the resources and terminals are integrated into a single data communications network. This network provides the accessibility Federated needs. It also makes more efficient use of existing facilities and allows for cost-effective expansion.

In the current system, all the resources of the previously separate systems and all the terminals, except the edge network terminals, are interfaced to the Pacx. A DEC VAX-11/780, which is used for distributed word processing and marketing information, has now been added and is also interfaced to the Pacx.

The VAX and the Tandem CPUs are connected directly to the Pacx. All the other resources are interfaced through Alanthus protocol converters installed in the Pacx cabinet. Modem links are used between the protocol converters and the remote hosts, and Line Misers are used for most internal terminal connections.

Besides being accessible, the system is cost-effectively expandable. Now, less expensive Ascii terminals can now be used, and only one terminal per desk is ever required. The Line Misers make the installation and relocation of these terminals inexpensive and fast. Federated can now install terminals at a cost of about $2,500, including the cost of the terminal, Line Miser, Pacx terminal board and installation.

WIRES from SR/22

optimizing a local network installation include provision for:

- Ample wireways.
- Wiring closets.
- Duct systems (trenches and cells, raised floors).
- Conduits.

Wiring closets should be aligned vertically, and whatever the data wiring facility, it should be connected to a wall outlet with a faceplate in the office.

Typically, a conduit runs from the outlet to the wiring tray or duct with ample space for telephone wiring as well as data wiring.

Proliferation of terminals complicates the architect's life in two more areas. Ideally, a cluster of terminals should have a separate power circuit because the increased number of new devices may likely require more power. Terminals also have a significant effect on air conditioning. Air-conditioning needs are usually related to the number of employees in an area. But one school of thought now contends that one employee plus one terminal has the same air-conditioning requirement as two employees.

For decades, architects have done a thorough job of including facilities for power and telephone wiring, but they have not really addressed information processing needs throughout the building. These rapidly growing, rapidly diversifying requirements can no longer be ignored.

The architect who thinks the office of the future is a concern for the interior designer should look again.

Hamilton is a senior marketing support representative for IBM in Raleigh, N.C.

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SPECIAL **REPORT**

Telecommunications to be glue for info

By John Vacca
Special to CW

Telecommunications will become the glue that holds all of the information resources together in the 1980s and 1990s. This technology will be the force that allows information managers to integrate computers, systems, networks, distributed processes and office systems into an effective integrated-resource management capability.

Advances in telecommunications are accelerating rapidly, and costs are dropping. The telecommunications movement is likely to build into an explosive force in the next 20 years; a force making possible automation, communications and information movement heretofore not even dreamed of by information managers.

Microwave links, which were considered exotic 15 years ago, will become much more common for business, medical and other communications needs in the next two decades. These links will probably consist of 4.632M-bit systems, using 21 channels of 168 each. They will be able to handle all data transmission between various points at speeds ranging from 14,400 to 57,600 bit/sec.

A major trend in the use of satellite communications systems is forecast for the '80s and '90s. The space shuttle and the proposed space station for the early 1990s will work together to manufacture and put into orbit huge satellites — weighing hundreds of tons, spanning thousands of feet — to cast communications footprints that will cover half of the world.

Two such satellites, in geosynchronous orbit some 30,000 miles in space, would cover the entire world. By the year 2000 there will be a worldwide need for 240 transponders for data, 2000 transponders for voice and 16,000 transponders for videoconferencing. Therefore, the satellite will be one of the stars of our emerging communications technology.

By the year 2000, some 72 million households in the U.S. will have subscribed to CATV. The recent marriage of CATV and satellite communications will eventually result in the manufacturing of cheap antennas at a cost of $65 each by 1995. These antennas could then be rented to home owners for about $5 a month.

The terrestrial answer to satellite communications will be fiber optics. Fiber-optic technology, which carries communications on a beam of light, will lower terrestrial communications costs dramatically for decades because it is so inexpensive to manufacture. Benefits include higher bandwidth, less noise interference, greater security and suitability for digital transmission.

While still more costly than copper cable, fiber optics will fall from today's 70 cents per meter to one cent per meter by the year 2000, thus eventually being cheaper than today's copper wiring. In the 1990s, we will see a rapid growth in the use of fiber optics by the telephone industry, CATV, computer coaxial cable and in government and industry installations.

Infrared transmissions will be another technology utilized before the turn of the century. Infrared is an optical transmission system that uses the infrared spectrum of LED.

By the year 2000, these systems will be able to operate as high as 15M bit/sec and if multiplexers are used, be segmented into 7.1M, 14.4M, 28.6M, or 57.6M bit/sec. It will be cost-effective at less than $5,000 per unit and replace local loops, which tend to be the weakest link in any system.

Private branch exchange

See GAME SR/34

SPECIAL REPORT

X.25 conversion supported by PAD function

Seen as an alternative to standard leased lines

By Leigh S. Ramby
Special to CW

Many companies currently operate multiple data networks, which are linked only between hosts used for file transfers. However, as communications costs begin to soar, alternatives to standard leased lines become more attractive.

One widely used alternative is the X.25 packet-switching network, which allows companies to consolidate their network facilities, eliminate duplicate communications lines and reduce overall network costs. X.25 networks also provide enhanced services that allow increased device utilization and flexibility by providing worldwide multiple host access to specialized applications and protocol conversions.

Further, the X.25 networks can provide users with increased reliability due to redundancy and automatic backup facilities, as well as simplified network expansion and improved network management and control. Using X.25 network technology, corporations are able, therefore, to create a single, integrated, easily managed network that is cost-effective.

But in order to use the packet network, each user device must communicate with it using the X.25 protocol defined by the Consultative Committee on International Telephony & Telegraphy (CCITT). Unfortunately, most data processing devices use either an asynchronous protocol, a Binary Synchronous Communications (BSC) protocol (for example, contention BSC for remote job entry [RJE] devices or polled BSC for IBM 3270-like devices) or a bit-oriented synchronous protocol.

These non-X.25 devices, therefore, require their native device protocols to be converted to X.25. The equipment or software used to perform this conversion is known as a packet assembler/disassembler (PAD).

The PAD function may reside in different kinds of equipment. For example, many public X.25 packet-switching networks have built the PAD function into their network nodes. Alternatively, many host computers support PADs built into their front-end communication software, thereby significantly reducing line interface hardware costs.

Vendors of front-end software PADs include IBM (NPSI software), NCR Corp. (Comten, Comm-Pro) and GTE Telenet Communications Corp. (DMEP software).

Some terminal manufacturers also have developed terminals which support some of these PAD protocols. Most prevalent is the "black box" PAD. More than 15 vendors today provide these black box PADs, which are best described as specialized concentrators which interleave several device lines into one X.25 line to the packet-switching network. These PADs may support one or more PAD protocols simultaneously.

In addition to converting native device protocols to X.25, the PAD is responsible for establishing X.25 virtual circuits (the communications paths through the packet network) for detecting and correcting device-related errors and for ensuring the smooth transfer of data between end users.

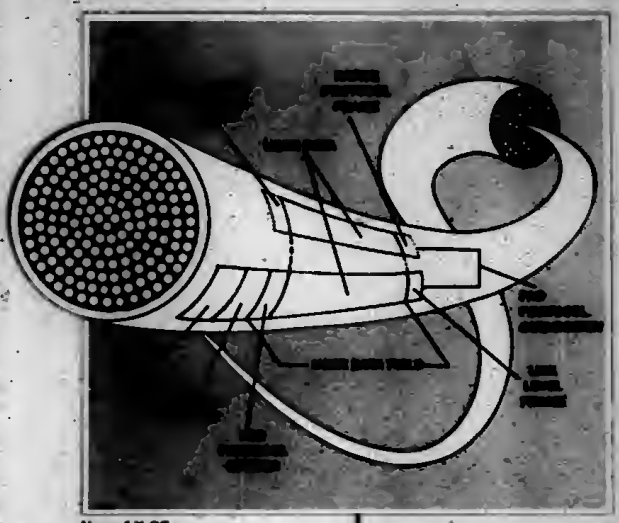
Thus, the "PAD protocol" that defines the rules used to perform these functions is specific to each device to be supported by the network. Also, the same PAD protocol must be used at both end points of a virtual circuit so that data may be properly transferred.

All PAD protocols share certain basic characteristics. For example, all PAD protocols transfer both PAD protocol control information and user data through the network. All information is passed in the user data field of X.25 data packets.

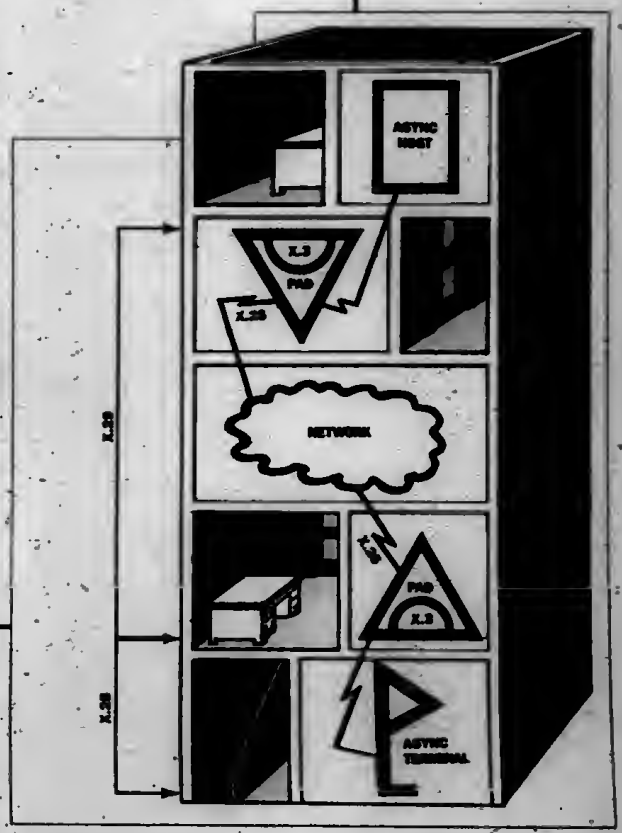
Some PAD protocols use separate packets called "qualified data" packets for PAD protocol control information. These are distinguished from normal data packets by setting the "qualified data bit" in the X.25 packet header. Other PAD protocols send the PAD protocol control information in a "PAD protocol header," which usually occupies the first few bytes of the user data field of the data packet. The X.25 network passes all information in the user data field of the data packet transparently through the network.

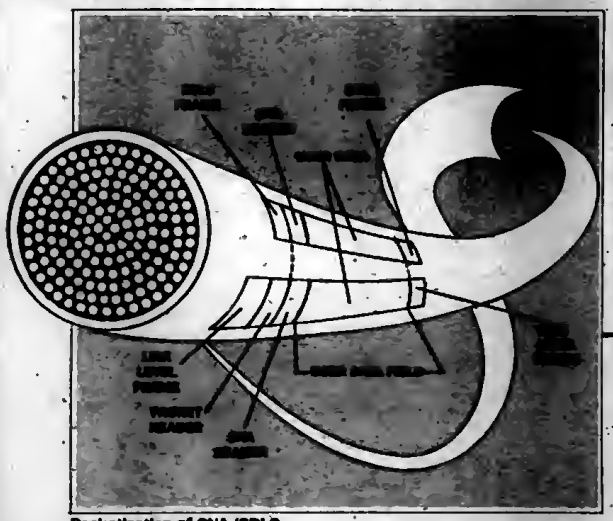
Another basic characteristic of PAD protocols is that a PAD is always required at each end of the X.25 virtual circuit in order for two end users to communicate. When sending data through the network, the sending PAD translates the end-user data into the X.25 protocol for-

See PAD SR/30



Use of X.25 by PAD protocols





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PAD from SR/27

mat, and the other PAD translates the data received in X.25 format into a format recognizable by the receiving end user. The PAD protocol control information is used to tell the receiving PAD how to translate the user data properly.

Actually, X.25 alone cannot support end-user to end-user (for example, device-to-host) communications. The X.25 protocol is only a network interface standard. X.25 defines how to get information into and out of the network — not what to do with the information once you have it. Thus, a PAD protocol is always required to control end-user to end-user communications through a packet-switching network. So far, the CCITT has defined PAD protocol recommendations only for asynchronous devices and hosts. All other device-specific PAD protocols have been left up to the PAD equipment vendors to define. As a result, the packet-switching equipment vendors have developed pseudo-standards for the PAD protocols they use to support some device types.

These PAD protocols are: the 3270 Display Systems Protocol (DSP) for 3270 BSC devices; the block-mode PAD protocol (Bpad) for BSC RJE devices (such as 2780/3780); and the high-level data link control PAD protocol (Hpad) and IBM's Qualified Logical Link Control (QLLC), the last two for Sychronous Data Link Control devices. Other device-related PAD protocols have been developed, but they are proprietary to the developing vendor and therefore are not standard throughout the industry.

CCITT Recommendations X.28, X.29 and X.3 define the PAD protocol for allowing asynchronous devices and hosts to communicate through an X.25 packet-switching network. These recommendations were adopted in 1977, and since then many PADs have been developed to support them, including the access facilities of most public X.25 packet-switching networks.

With this PAD protocol, a virtual circuit is established for each asynchronous device on the X.25 network. X.28, X.29 and X.3 (nicknamed the "triple X" recommendations) use only qualified data packets to transmit control information. The X.3 recommendation defines this control information in the form of parameters.

The value of each parameter determines how a particular event is to be interpreted and handled. For example, one parameter defines how to handle break; another defines how to handle character echoing; and another defines the packet-forwarding rules.

The X.28 recommendation defines how the terminal user communicates with the PAD to control the connection through the X.25 network. The terminal user may ask the PAD to establish or clear a virtual circuit or to change the values of specific parameters for a virtual circuit. The X.29 recommendation defines how data and control information flow between PADs.

DSP defines the procedures that control the emulation functions and coordinate the host and terminal PAD operation. These procedures cover the 3270 data transmission through the network, virtual call establishment methods and procedures and local and end-to-end error recovery. The DSP protocol uses both qualified data packets and PAD protocol headers to pass control information through the network.

In order to communicate with a host, each 3270 device must first establish a virtual circuit through the network. Since separate virtual circuits are established for each 3270 device, each terminal can access a separate host or host application on the network. Once a virtual connection between a 3270 host and 3270 terminal is established by the PADs, the network is completely transparent.

The Bpad protocol allows BSC remote job entry devices, such as IBM 2780s and 3780s, to communicate through an X.25 packet-switching network. The Bpad protocol defines the procedures for virtual circuit establishment, flow control, time-out handling, error recovery and data transfer.

All BSC control sequences may be processed locally so that only user data is sent through the network. Unlike 3270 DSP, the Bpad protocol is a symmetrical protocol. Thus, it allows host-to-host and terminal-to-terminal communications through the X.25 network in addition to host-to-host terminal communications.

As X.25 packet-switching networks are expanding their services to support more synchronous devices, the need for PAD protocol standards is growing. These standards allow devices to communicate with multiple hosts on X.25 nets provided by vendors all over the world.

They allow the interconnection of synchronous services on public and private X.25 networks, domestically or internationaly. Standardized PAD protocols are an integral step toward providing universal access to X.25 networks, thereby obtaining a single integrated network supporting all communications needs.

Hamby is manager of network services for GTE Telenet Communications, a public packet-switched network services vendor in Vienna, Va.

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April: A little machine goes a long way

The dust from the corporate microcomputer boom is finally starting to settle. For many firms, the mad dash to buy and install microcomputers is ending, and the development of plans for coordinating and controlling micro use is beginning.

Computerworld will publish its second annual "Micros in Big Business" Special Report in the April 30 issue. This special section will focus on the success and failure of micros in large organizations. Included will be articles covering micro-to-mainframe links, microcomputer networks, compatibility issues and the growing concern about security and data protection.

How are microcomputers working out in your organization? If you have a story you would like to share (either bitter or sweet), *Computerworld* would appreciate hearing from you.

Contributions can take one of two forms: a tutorial article that discusses an issue in corporate microcomputing; or a story that outlines a user's experience with micros.

Articles must be typewritten (double spaced) and no longer than eight pages. Artwork such as charts or photographs is encouraged. Authors should include a brief biography and a phone number where they can be reached.

The deadline for submissions is March 5.

Articles for the April 30 Special Report should be addressed to Donovan White, Special Reports Editor, *Computerworld*, 375 Cochituate Road, Box 880, Framingham, Mass. 01701.

GLUE from SR/26

switches will represent another technical evolution. Data and voice will be merged and transmitted over the same lines.

In the next two decades, 75% of all switches will be digital, while today, 90% of them are of the analog variety. Digital networks will eliminate the need for special cables and modems to translate from analog to digital and back again. These networks are faster, of better quality, lower cost and computer-compatible.

In addition, they will allow all terminals, computers, telephones and other data and voice communications systems to hook up to the same physical lines. Digital technology will have a profound impact, not only on business communications, but for consumers as well.

Growing on a variety of different fronts is the new service of electronic mail. The U.S. Postal Service's effort to stay in business in the next decade will be its proposal for electronic communication of mail.

In addition, banks will provide electronic-mail lockboxes to speed corporate cash flow; communicating word processors will spread rapidly around corporate offices; message-switching systems will grow at a fantastic pace; and facsimile transmission for physical document distribution will be much faster and cheaper. As more users are found for this new mode of communication, electronic mail will no doubt continue to increase steadily.

Teleconferencing in the year 2000

As an alternative to person-to-person communications, teleconferencing promises to be one of the most effective future methods of communication. By the year 2000, teleconferencing will be available in virtually all U.S. cities.

Present rates will drop to $1.50 per minute for coast-to-coast calls. The system which presently connects two groups in separate cities so that they see, hear and interact audiovisually with each other as if they were in the same room, will eventually be able to connect as many as eight separate groups together. A $90/hour meeting will pay for itself many times over in tens-of-thousands of dollars saved in travel costs.

The real future of teleconferencing will be international. Slow-scan or freeze-frame video will be used to provide service on an intercontinental level.

These new technologies and services are all examples of the dramatic changes that we can expect in the world of telecommunications. This new technology and accompanying changes will give the information and telecommunications managers both the challenge and the opportunity to put them to work for the corporation. Computing and communications costs will eventually replace labor and transportation costs.

Communications and computers will rapidly merge into a single industry. As we move into the interlinked information world of tomorrow, the growing cost of telecommunications services in the company will receive increasing attention from management. A more sophisticated management will be needed to meet the future challenges of this increasingly complex environment.

Vacca is a free-lance writer based in Topeka, Kan.

SPECIAL **REPORT**

Users access bank accounts with home micros

NEW YORK — Paying bills has always been a tedious chore for many people — writing checks, addressing envelopes, buying postage stamps or perhaps even hand delivering payments to creditors. This time-consuming process, along with the accompanying paperwork, can now be eliminated with the help of a new electronic home banking system developed by Chemical Bank of New York.

Offered on selected personal computers, the Pronto Home Banking System has already allowed hundreds of customers to pay bills, send messages and conduct banking transactions quickly and reliably from their own homes.

The system, which has been tested by 200 users in the New York metropolitan area since November 1982, was launched commercially to the public in September 1983, according to Charles Forbes, a vice-president in Chemical Bank's Electronic Banking Division. Over 1,500 customers had subscribed to the service by the end of 1983.

More than 400 New York area and national merchants, including major department stores, credit card companies, utilities and large landlords, already accept payment from the home banking system. In addition, Chemical Bank has licensed Pronto to eight banks throughout the U.S. and plans to create a nationwide network for home information. Pronto currently is offered on personal computers from IBM, Apple Computer, Inc. and Atari, Inc.

To ensure the service's around-the-clock availability, Chemical Bank runs Pronto on a Nonstop II computer system from Tandem Computers, Inc. Tandem builds fault-tolerant machines designed to keep on working even if a processor fails.

The home banking function currently supports six major services: bill paying, bank balance inquiry, funds transfer, bank account statements, budgeting and electronic check register.

To pay bills, customers simply key in the amount and date of the payment. Until the payment is actually made, the user, sitting at home, can modify or cancel it. The user receives immediate confirmation, and a reference number indicates the payment has been scheduled.

"Bill paying is the most important banking service we offer," Forbes said. The average customer receives and pays about 150 bills per year. Pronto allows these bills to be paid directly from accounts without writing checks.

Because this eliminates paperwork and speeds up the entire bill paying process, it saves money for everyone involved — banks, creditors and consumers. In fact, many companies will soon begin billing consumers electronically, yet still provide as much information as they now do on a paper invoice, he says.

Robert Lipp, president of Chemical Bank, agreed. "By eliminating the paper bill and postage required to deliver it to the customer, along with the customer's check and return postage, we estimate annual savings in the billions of dollars," he said. "Consumers will benefit from these savings directly as well as indirectly in the form of lower prices on merchandise."

Lipp also noted that U.S. companies mail out about eight billion bills each year at a cost of $1.02 per piece, including postage and check handling. In contrast, electronic bill payment runs about 35 cents each, he said.

Another important home banking function, balance inquiry, permits customers to check balances on all their Chemical Bank accounts — checking, savings, Mastercard, Visa or installation loan files. For example, customers can verify Visa balances by pushing a button and calling up detailed account listings on their home screens.

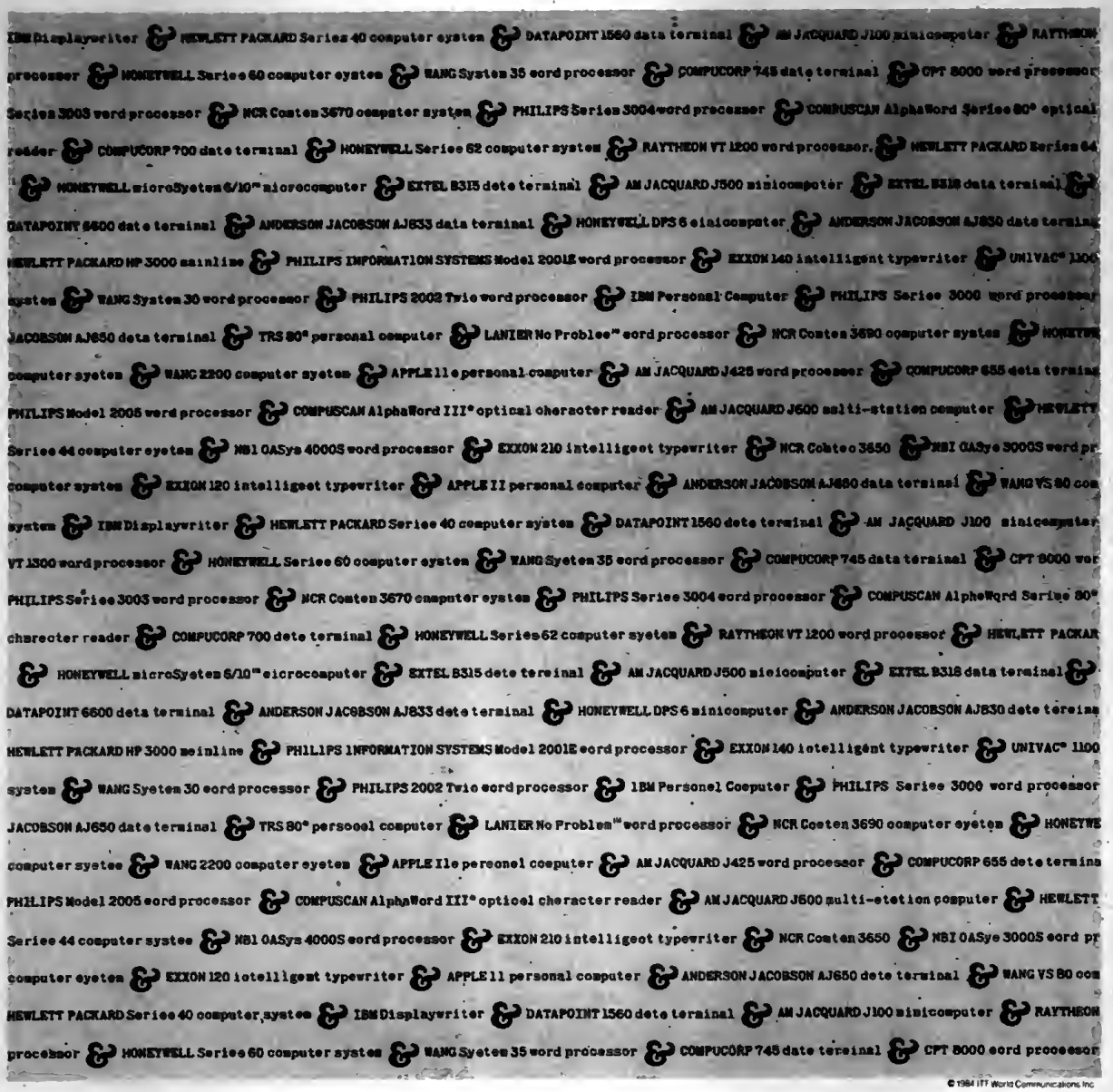
The electronic mail service allows customers to send messages instantly, either to the bank or to one another. Similar to a telephone book, the electronic directory service provided by Chemical Bank assists users in looking up other customers' names. In addition, electronic mail permits Chemical Bank to contact customers individually or as a group.

With account maintenance, users can change their personal identification codes or request that new bank accounts be added to their Pronto service. This feature is extremely popular because it gives customers the flexibility to change the way they use the service without first contacting the bank, Forbes said.

Additional services include funds transfers, which allow users to transfer money between predesignated accounts approved by the bank; statements, which provide descriptions of all transactions; budgeting, through which customers can establish up to five separate budgets and classify payments into 50 possible budget categories; and electronic checkbook.

"Electronic checkbook is a mini-account reconciliation program,"

See Next SR/38



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SPECIAL **REPORT**

Electronic firm ties 8,500 stores nationwide

FORT WORTH, Texas — With some 5,500 company-owned retail stores and 3,000 dealer/franchise outlets, Tandy Corp. operates the largest number of consumer electronics outlets in the world. Efficient management of this $2 billion per year business has mandated the evolution of a highly reliable and efficient data transmission network.

The initial charter of Tandy data processing — operating out of headquarters here — was to support the corporate mailing list. Today, Tandy's corporate data processing department supports literally every phase of the domestic operation as well as some international needs. Whether it's manufacturing, distribution, payroll, accounting or mailing lists, DP growth has accompanied corporate expansion.

The retail stores and dealer sites are supported by six regional warehouses located here and in Boston; Charleston, S.C.; Columbus, Ohio; and Woodland and Garden Grove, Calif. Fort Worth is the locale of a "force-feed" warehouse which supplies both overseas and domestic outlets.

Until recently, order entry, warehouse distribution and inventory control were carried out using a combination of manual and batch procedures. Gary Jolley, DP operations manager of warehouse distribution, explained some of the old methods: "Preprinted order forms were filled in by hand at the stores and mailed to our warehouses," he said. "These forms were sorted and then taken out to the warehouse floor where merchandise was pulled."

The old method, in short, was not keeping pace with Tandy's growth. More significantly, it wasn't contributing to that growth, as Tandy's DP distribution system manager Mary Lou Edwards pointed out.

"The data on those orders was then keypunched and transmitted to our corporate data center at headquarters through a 2,400 bit/sec modem on a dial-up line daily," Edwards said. "The next morning we sent the warehouse a printout of their invoices, a billing method which did nothing to increase warehouse productivity. The warehouses weren't getting enough reports in a timely enough fashion to help them control their work flow.

"About seven years ago we began developing a plan to computerize our warehouse distribution system," Edwards said. "At first, we elected to install a computer at one of the remote warehouses as well as here in Fort Worth. Each warehouse would have its own computer, handle its own data processing activity and just transmit records to the central mainframes at night.

"The total cost for that approach would have been comparable to that

of our present system; however, with our present configuration we have better central site control over the data base. We don't have to worry about things like software updates and file control, and we require fewer technical support people both here and at the remote sites," Edwards said.

So Tandy opted for a centralized processing approach for the warehouse distribution system.

Radio Shack's own TRS 80 Model 4 microcomputers at each retail store handle an operating system which

See TRS SR/38

TRS from SR/37

performs, among other things, the order-entry function. Tandy's store operating system assists the store with information on what to order, how much and when, in order to maintain optimum inventory levels.

The orders are transmitted to the corporate data center here, and then the information goes to the system located at the Fort Worth distribution DP center. Inventory will either be shipped out of the Fort Worth force-feed warehouse, the computer warehouse or one of the regional warehouses; at this point in the ordering process, all data transmissions between the mainframes and the warehouse terminals are on-line. And the volume of traffic in the network is enormous.

Tandy's Fort Worth warehouse alone distributes 800 shipments daily, requiring a pulling of some 120,000 lines and shipment of more than 6,000 cartons. Combined regional warehouse daily volume totals some 2,100 shipments of 65,000 lines in 28,000 cartons.

Data describing 50 million lines and 500,000 shipments is transmitted through the network annually. All of the warehouses throughout the U.S. access the mainframes through Codex Corp. data communications equipment.

Each of Tandy's warehouses and the data center are configured with Codex 6030 Intelligent Network Processor statistical multiplexers.

Most warehouses have 13 terminals and five printers. The 6030s take data from multiple terminals and concentrate it using statistical multiplexing and data compression techniques.

In the event problems occur, backup is available with the modems. "The Codex LSI 9600s have dial backup capability," Edwards noted. "So if we lose a telephone line, we can provide backup service. And with the Codex Comm diagnostic equipment, we can detect line problems and actually determine the type of problem."

Some six different warehouse systems have been installed within a 16-month period as modular additions to the warehouse mainframe and Codex equipment. "This expansion caused absolutely no impact on any of our existing warehouses," Edwards said. "We simply added them on weekends or nights."

HOME from SR/35

Forbes said. When the customer enters the check number and amount, Pronto balances the account for them. "Electronic checkbook is an invaluable service for those of us who always seem to have trouble balancing our accounts."

Forbes added that the Pronto system soon will include several nonbanking services. "We plan to package the system with other capabilities, including recordkeeping, news and educational services, catalog shopping, weather reports, stock quotations and portfolio analysis."

To use the Pronto home banking service, the customer needs a home computer, with a modem hooked up to a telephone, and a television set or display terminal.

Costs and security

Forbes said the cost for the home computer and modem is as low as $125, while the monthly subscription rate is $12. For security, each authorized user assigns himself an identification number, as well as an individual code name or "handle."

The user activates Pronto by inserting a special communications software cartridge or floppy disk into the home computer and instructing it to dial up the bank automatically through a public packet-switching network.

After the home terminal connects with the bank's computer system, a three-item main menu appears on the screen, allowing the user to call up either the electronic mail, account maintenance or home banking functions, Forbes said.

Subscribers can access the service 24 hours a day, seven days a week through an automatic dial-up modem attached to their terminals and telephones.

Forbes pointed out that as the network of banks using Pronto expands, the computer system will grow with it. Chemical Bank currently has an eight-processor Nonstop II system.

SPECIAL REPORT

Corporate info needs reliable transport

Network failure may mean large dollar losses

By Alan Sokal
Special to CW$

Corporations are now facing one of their toughest challenges — the information explosion. As business becomes more complex, executives at all levels find they must have more information relating to how the company operates. This quest for expanded information has led to the increased collection of data in virtually all departments within a company.

As these data bases proliferate, information must not only be accessed, but analyzed and processed throughout the corporation in an understandable form.

And since most business information systems are now automated, the ability to deliver information where and when needed within the organization becomes crucial to efficient, continuous operation.

With the growth of personal computers and local-area networks, automated delivery of information within a corporation requires a reliable transport mechanism readily available to all users. This type of transport mechanism is typically referred to as the corporate communications network: it provides the capability for management to access vital information and maintain a competitive edge. It's also the resource that keeps customer service at eye level in a post-divestiture environment.

In many industries, the uninterrupted flow of information is the lifeblood of a company. Airlines, hotels, car rental firms, banks and brokerage houses are among the more noteworthy examples. As such, companies in these industries are extremely dependent on an efficient, real-time data communications network.

If a network failure occurs, companies dealing in time-critical information are vulnerable to high revenue losses, to say nothing of good will — $10,000 per minute in the case of airlines and up to $1 million per minute for an international brokerage firm (see Figure 1).

With increased reliance on corporate communications facilities, operating costs have steadily risen. This has lead telecommunications professionals to seek tools that help to optimize their operations. Network managers, working closely with data communications suppliers, have developed specialized systems to control network operations totally.

Originally, these systems were based on test equipment that monitored technical operating parameters to give highly trained communication network specialists detailed data. Such systems measure complex parameters and were meaningful only to skilled technical personnel.

Now, sophisticated computer-based communications systems have dramatically increased the quantity, quality and availability of critical data for the decision-making process. Using computerized analysis of network data, the telecommunications staff is now able to create a data base that helps to make the corporate communications system more reliable and less costly to operate.

Continuous monitoring of normal network operating parameters is vital to improving the efficiency of these systems. When operators know the network threshold levels that are needed for trouble-free operation, they can easily detect degrading line conditions that lead to malfunctions and outages within the network. Operators can download these parameters, and the system will automatically alarm if the thresholds are exceeded (see Figure 2).

These systems will help provide nonstop operation, optimize network configuration, record all network faults and events and continually monitor network performance. In or-

See INFO SR/40

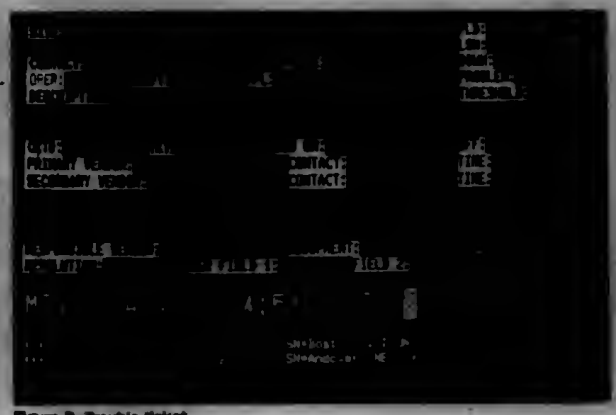


Figure 2: Trouble ticket

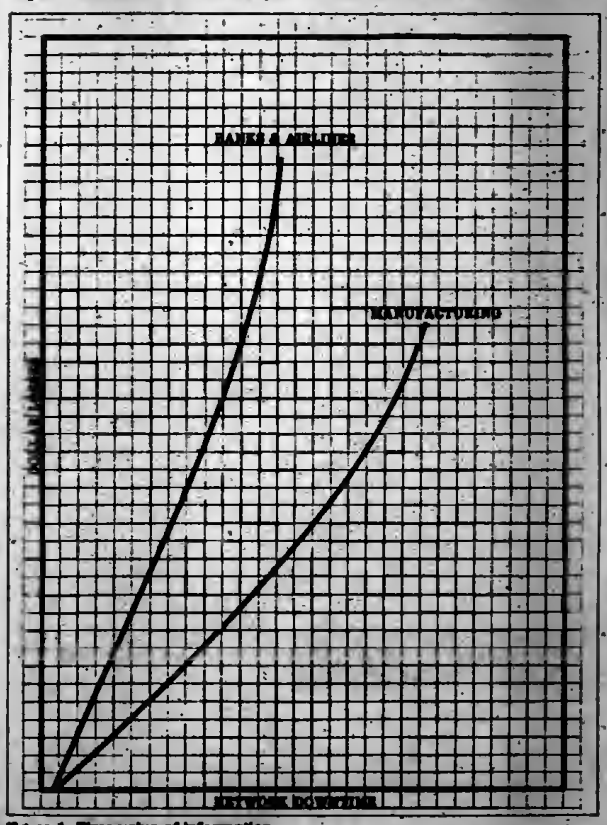


Figure 1: Time value of information

INFO from SR/39

der to collect this type of data, the system must have the capability to monitor the condition of these communications lines, terminals and cluster controllers, which provide intelligence for a variety of devices operating on the network.

The ability to collect this network data gives management the key to making the network operate more efficiently and with greater reliability, both from the external perspective of line, modem and terminal failures, and from the internal dimension of software problems, bit error rate, response times, mainframe problems and other parameters of the data processing system.

As long as operations are maintained within normal limits, system operators receive no unusual indications at the control center. However, any deviation from established norms can trigger a series of alarm indications, depending on how the system is programmed.

On lines which must remain operational, it is possible to set alarm thresholds to give preliminary warnings even when the slightest deviation from normal is detected. The establishment of threshold levels is an important criterion that must be considered carefully by those versed in the corporate goals of the network. If levels are set too tightly, alarm indications will be triggered for random line deviations, often wasting the time of staff specialists on little more than routine situations.

On the other hand, if levels are set too loosely, serious line degradations might not receive attention until a line is close to a total outage. In the final analysis, the proper threshold level can only be determined by the telecommunications manager.

Today's integrated systems make it possible for network operators to track performance data in real-time. Network faults and alerts are typically detected within one minute. If users at a specific location indicate they are experiencing response-time problems, an operator in the network control center can immediately confirm the status of network facilities.

With access time at about five seconds for this type of information, the operator has immediate answers that help to pinpoint the cause of malfunctions and estimate when off-normal conditions can be corrected, thereby improving the reputation of communications staff among users. Once a problem has been isolated to a specific location or parameter, it is much easier to apply specific test sequences. This, in turn, reduces the time to clear an off-normal condition.

As more detailed performance data becomes available, specialized software will allow a variety of users to access detailed network information. While technical specialists may need to have very precise tabular data displayed, corporate managers may not. Their requirements may be for more general summary statistics in an easy-to-read graph.

Maximum graphics

A fully integrated network command center system can provide maximum graphics features to serve the needs of both specialists and managers. In these systems, network performance data can be displayed in color on visual display terminals or printed out for hard-copy analysis. The availability of a system processor with a large data base provides the flexibility to present network data in a format that can answer a multitude of questions relating to network operation and performance.

By providing telecommunications features necessary to present network data in graphics formats, it becomes easier to make management aware of network operations. Nontechnical managers may not want to see a detailed report on technical data, but might be interested in a summary of terminal usage in certain time periods or by application.

Using stored traffic pattern data, the telecommunications manager can simulate the impact of more terminals, higher speed modems and similar changes to existing network operations. Proposed solutions can be easily tested against the known traffic patterns.

Indeed, the age of information is upon us. And with networks growing faster

See INFO SR/42

SPECIAL REPORT

Intelligent nets: tying incompatible equipment into cohesive info system

By Joel Edwards
and Sandy Stutz
Special to CW3

While technology planning is best done before incompatible computing equipment is purchased, computing equipment tends to spread a lot faster than technology plans. There is one way to implement technology planning after incompatible equipment is in place, a way that will leverage that equipment into a cohesive information system. It involves the concept of an intelligent network.

An intelligent network integrates existing incompatible equipment into a single information network, so data generated in diverse application domains is available to the corporation as a whole (see figure). This can be accomplished by implementing a backbone network of similar processors and gateways linking that network with applications throughout the company.

The backbone network performs all advanced communications and integration functions for the corporation, such as managing a corporate data base that includes data from all the application domains and message-switching for the various forms of information (graphics, text, facsimile) that are available through the gateways. Each gateway is a customized interface designed specifically to meet the needs and capabilities of its application domain. When new domains are added or new equipment is added to existing domains, integrating that equipment becomes a matter of adding another gateway.

There are stringent requirements that must be met to implement an intelligent network successfully:

■ The information that it manages must be continuously available. The intelligent network stores and handles vital corporate information. It must, therefore, be extremely reliable. Virtually no downtime can be tolerated because any system failure will cripple the organization. In addition, the system must guarantee the integrity of the information that it stores and transports.

■ The information must be accessible from any application domain. Users must be able to access information throughout the network from any of these domains, assuming that they have the right access privileges.

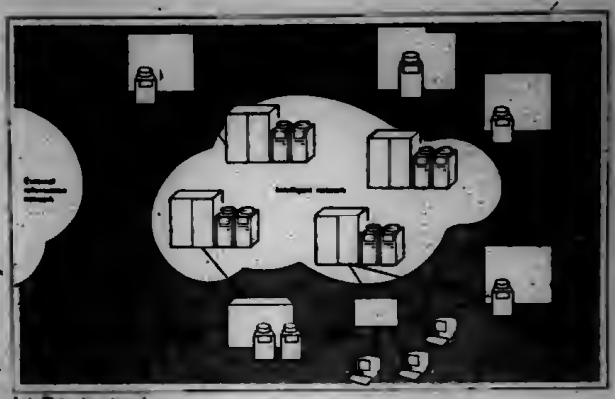
■ The network must be flexible enough to accommodate change. It must allow the organization to adapt to changing technologies, changing organizational topologies, increased information volume and varying reporting requirements.

■ The network must be able to store and transport any type of information relevant to the business. Graphics displays, data base records, edit files, facsimile images, digitized voice and so forth must all be accommodated, and the system must provide straightforward, consistent interfaces between them.

■ The distribution information in the intelligent network must be accessible as a single corporate resource. The information system must consolidate and control the flow and sharing of data in the distributed environment (that is, between many sites of activity).

To meet all of these needs requires a backbone network with a combination of features. Sophisticated networking facilities are necessary to keep the various application domains in constant communication, and to make full use of this corporate-wide communication, the network

See NET SR/42



Intelligent network

"Maybe it got garbled in the transmission?"

NET from SR/41

should include an electronic mail system.

The purpose of the mail system is to facilitate noninteractive communications. This allows information to be delivered in a timely fashion throughout the network, whether the recipient is immediately available or not. Information can be communicated between application domains in this manner.

To accommodate such communications, the information and processing capabilities of the backbone network must be distributed. Distribution of control enhances the efficiency, modularity and reliability of the intelligent network as a whole. It also allows the diverse application domains to customize their particular interfaces to the network.

A sophisticated backbone network with distributed intelligence makes another feature possible — a distributed data base. The files in a distributed data base are located on systems throughout the network, wherever they are most needed. This means that corporate headquarters in New York can access manufacturing data located at a manufacturing plant in Texas. At the same time, that plant in Texas has local access to the data, as well as local control.

The intelligence located within each network node means that the nodes can be multifunctional. Each node must have the capability of running various applications and utilities (local or network) and acting as an intelligent switch between the application domains and the backbone network.

Fault tolerance and on-line access are also necessary features in an intelligent network. Because the business is literally run with that network, the network must be continuously available despite component failures. And the information available throughout that network has to be available on-line because it may be needed at any given moment for use in critical business decisions.

An intelligent network with these features would solve the problem of integrating incompatible computing equipment and would leverage an investment in existing software. Being evolutionary and flexible by nature, an intelligent network leverages investments without locking the user into a single vendor solution or requiring integrated networking standards to be set.

With an entire corporation integrated in this manner, productivity and, therefore, profitability would be vastly improved. Increased corporate communications, improved decision making through the constant availability of timely information and remote access to locally controlled data are just some of the benefits of linking a corporation into a single operating entity through an intelligent network. But implementing an intelligent network requires more than technology; it requires a firm decision and commitment by upper management.

Edwards is a data communications engineer and Metz is a technical public relations specialist at Tandem Computers, Inc. in Cupertino, Calif.

INFO from SR/40

than the availability of people to manage them, strategic communications planning is beginning to take place on many levels.

Analyzing user needs and responding to these needs are the foundations of such strategic planning. And it is along this path that fault-tolerant networks earn their daily bread, applying the technology to acquire and disseminate information in a sensitive marketplace.

As more and more companies are learning, the corporate communications network is sparking a transformation in the way they conduct their business and providing an ever-present vision of the network as a corporate asset.

Brind is manager of product marketing for network command center products at Infinet, Inc. of Andover, Mass.

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Oil drilling firm strikes it rich by transferring info with own packages

FORT WORTH, Texas — Since 1939, Western Co. of North America based here has provided the petroleum industry with essential drilling and completion services for the exploration, development and production of oil and gas. With assets in excess of a billion dollars, Western has consistently been a pacesetter in this highly competitive industry.

But high growth has brought on new technical challenges. According to Joe Adamo, telecommunications manager, "During the 1979 to 1980 time frame, with the [Organization of Petroleum Exporting Countries] price increases, drilling activity was very high, and the company was doubling its growth. We had to improve the handling and transfer of information critical to our operations."

This information — everything from materials inventory and equipment maintenance to management reporting and payroll — is continually transferred between Western's regional office centers, 50 district offices and corporate headquarters. "Prior to 1980, many functions were accomplished through manual systems," Adamo said. "The districts maintained written logs on materials usage and inventory. Some managers would stock lightly, while others would stock heavily on items. It was essential to even out inventories and go into volume purchasing across the company to improve materials management."

Ben Albino, shift supervisor in the operations section, also noted the inefficiencies. "We had an IBM 370/138 operating under DOS, with .5M byte of memory. After the data was mailed in from the districts, it would take a day to key it into the system for processing — and our payroll would take an agonizing 16 to 26 hours to run."

It was apparent that a major upgrade in computer and communications capabilities was required. Western's management viewed the investment as one that would increase both service to customers and the efficiency of internal operations.

The comprehensive blueprint for data processing and the supporting communications network that Western designed more than met the company's goals, resulting in an inventory tracking system that Western is marketing to other companies. Western customers benefit from an engineering software package that gives them better analysis of field data on well drilling operations. They also have access to Western's "supervan," a mini computer center on wheels that does analysis at the well sites.

Success of new software programs

The success of the new software programs developed by Western depended upon how readily the programs could be accessed by Western personnel at remote locations around the country. Western needed a communications network that would reach all locations cost-effectively and reliably while being centrally controllable.

Why was central site control crucial? "The staff in our regional and district offices is comprised of sales and administrative-type personnel who simply do not have the technical background or training required to assist in extensive network testing," Adamo said.

Fifty-eight dedicated private leased lines tie 73 separate locations to the Western data center here. An

See OIL, SR/48

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SPECIAL **REPORT**

Stock exchange trades traditional net idea

NEW YORK — Compared with more traditional arrangements, local networks are usually touted as a better way to allow the sharing of information, whether on a central computer, peripherals or a number of microcomputers. But a primary benefit of phasing out a traditional network can be to decrease the number of I/O devices, thus conserving a very scarce commodity: floor space in a crowded stock exchange.

Over a period of years, the American Stock Exchange (Amex) designed and implemented a data communications network to serve the trading posts located on the exchange floor.

The network also connected the posts with the member brokerage houses of the exchange. Unfortunately, the design of the network dictated that increases in overall trading volume often led to the installation of new peripherals on the trading floor.

Flow of transactions

The general flow of transactions around the network was as follows: Orders for the purchase of stocks were usually entered in a member firm's own computer network by the firm's stockbrokers at their offices around the country. The orders were then transmitted either to a message-switching host computer at Securities Industry Automation Corp. (Siac) or directly to the firm's own booth area at Amex.

Siac, a subsidiary of the New York and American stock exchanges, acts as the data processing organization for the exchanges. Amex is located on Wall Street in New York and is the second largest stock exchange in the U.S. Orders sent to Siac are routed via Siac's common message switch to a host computer designated post-execution reporting (PER) for initial processing. PER then routes the order to a printer at the appropriate post on the trading floor.

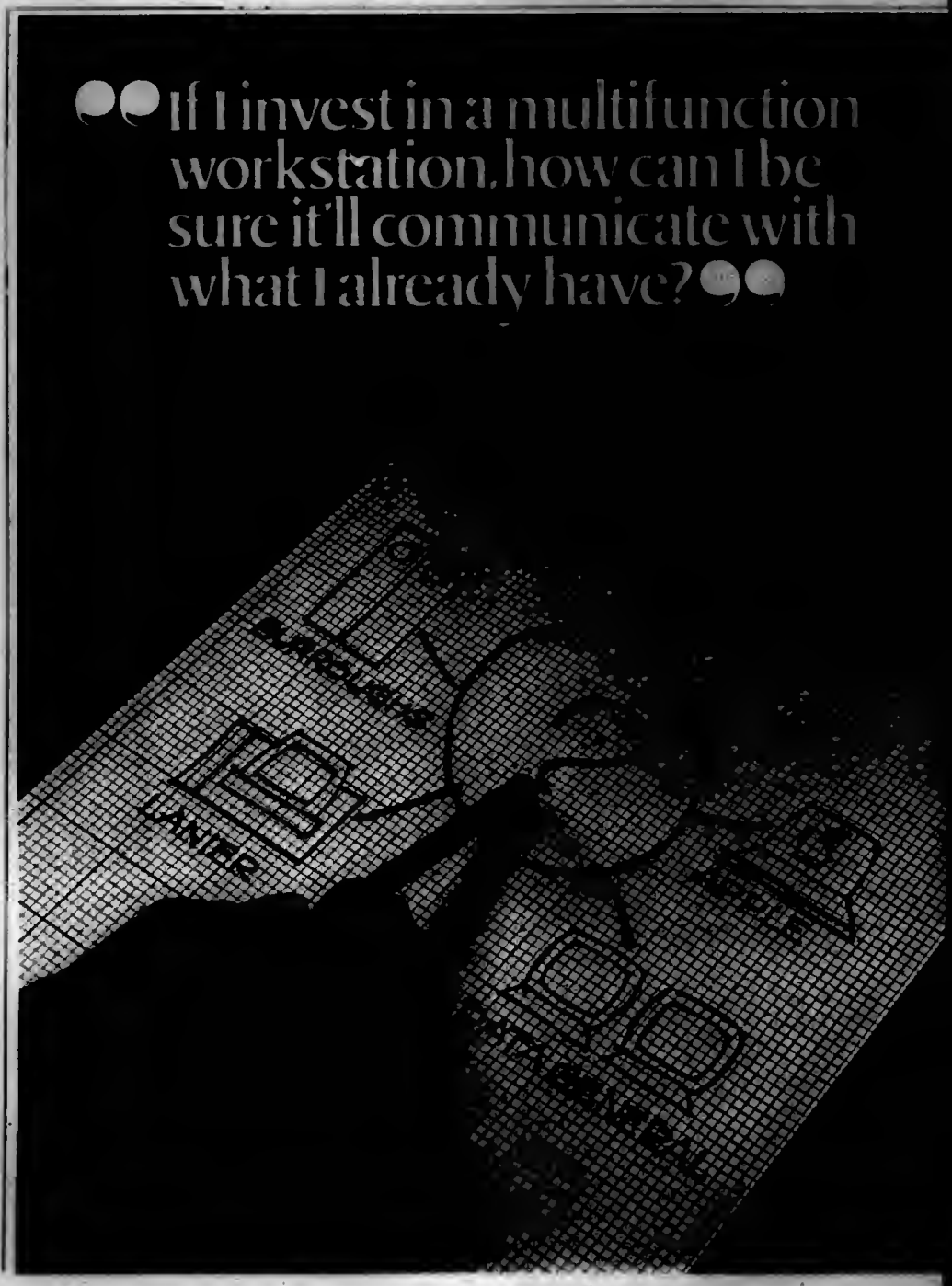
Each stock is traded at only one floor post. Orders sent directly to a firm's booth area are carried to the appropriate post by the firm's personnel. Each order is then handled manually by the specialist for that particular stock, who then matches compatible buy and sell orders.

Once an order is executed, either one or two cards are marked to record the trade. Orders that entered via a booth produce a market data switch (MDS) card that is sent to the MDS host computer. This computer produces the well-known ticker that shows all trades. Orders that entered through Siac produce an MDS card and a PER card that is sent to the PER host. Eventually, the order information is routed back to the originating brokerage firm and then back to the office placing the order.

Initially, PER and MDS each had its own dedicated card readers and printers. Before long, the number of these peripherals began to mushroom. As these devices began proliferating, so did wiring and modems. If an additional device was needed, due to increased overall trading volume, two devices had to be added — one for PER and one for MDS. Since the devices used a dedicated communications line, each new device meant another line from Amex to Siac, with the host computer site located a few blocks away.

More computers also meant more card readers and printers. The hardware and wiring needs began to snowball, and the problem was intensified by the shortage of space on the exchange floor.

In late 1980, Siac and Amex began looking for a new network design and technology to support Amex trading. Around the same time, local-area nets were emerging, and this technol-



SPECIAL REPORT

for local network to conserve floor space

ogy was chosen as the most effective means of coping with the problem of connecting the devices and computers while efficiently using space on the trading floor.

The local network approach offered many advantages. First, and perhaps most important, a local network costs about half as much as an equivalent message-switching approach. The use of the local network meant that one card reader or printer could serve MDS and PEB as well as all future hosts. In addition, the number of dedicated lines and modems would be reduced. The local network also would help to reduce future wiring and installation costs and, thus, would provide a relatively inexpensive incremental growth path.

Another advantage is the network's ability to handle multiple data channels, as well as CATV, closed-circuit TV and voice and facsimile transmissions.

The network, provided by Contel Information Systems, Inc., Great Neck, N.Y., is based on an early version of Contelnet, a local network developed by Contel that uses broadband coaxial cable bus architecture.

The initial application of the network connected 20 card readers distributed on the exchange floor to the MDS and PEB host computers located in the Stac building. Twenty-four communications lines and 48 modems were eliminated in the first phase of development. Plans are now under way to provide communications between the hosts and printers on the floor of the exchange.

Once the local network technology was chosen, Stac's and Amex's long-range objective was to implement the overall architecture. The new network is called the American Stock Exchange Network (Amnet). However, Amex and Stac decided to take a phased approach to the realization of their final architecture. The first step is a network named Amex Card Reader System (Acars). The Amnet configuration will be realized during the recently begun phase of network development.

Bus interface units

Both Acars and Amnet use bus interface units for connections to devices and hosts. These are micros that provide the hardware and software interface between the card readers and the cable bus. The bus interface units perform protocol conversion, insulate host software from the card readers and control all the movement of card images between bus interface units over the bus.

Only card readers are supported on the Acars network. Printers continue to be handled by each host. Further, because the RS-232C cabling from the Amex equipment center to the trading posts was already in place, the bus interface units supporting the card readers were not distributed around the exchange floor. Instead, all bus interface units are located on shelves in the Amex equipment center. Since the host and the network control center are located in a separate building, communications lines are necessary to connect these devices to the local networks.

In addition to the bus interface units, Acars includes a network control center that provides eight on-line control capabilities:

- Network definition and initialization commands allow the user to define the particular configuration. For example, the user must define the characteristics of each bus interface unit and each port.
- Downline loading is available under operator or programmed control. Downline loading occurs at initialization and fault detection in

See AMEX SR/48

OIL from SR/44

IBM 3705 serves as the front end to an IBM 370/3033 mainframe operating under OS/MVS, ACF-Vtam/Network Control Processor with IBM Systems Network Architecture/Synchronous Data Link Control. From the 3705, all data is sent through a Codex Corp. Intelligent Matrix Switch, which is used primarily for line monitoring and A/B switching within the 3705.

"The Intelligent Matrix Switch gives us the ability to monitor any line. . . . We can also do any reconfiguration electronically instead of using manual patching," Adamo said.

From the Intelligent Matrix Switch, data paths are concentrated in five centralsite Codex 6040 Intelligent Network Processors (INP). All of the data traffic between the five regional concentrator locations in New Orleans; Midland, Texas; Oklahoma City; Denver; and Houston are transmitted over five 9,600 bit/sec leased lines. The statistical multiplexing and data compression capabilities of the INPs yield an apparent 235% to 230% efficiency on the 9,600 bit/sec trunks.

About 100,000 Intelligent Matrix Switch and time-sharing transactions alone are transmitted through Western's network each day.

Improved management reporting has been, perhaps, one of the most important benefits of the network.

"Our detailed general ledger reports used to be printed here in the data center and mailed to the districts," Adamo said. "And they wouldn't receive it for a day or two after printing, whereas all of our upper level management staff at headquarters here would have same-day service. Consequently, they'd call the districts with questions on expenditures before the managers had a chance to see the same information.

"Now everything — from the profit-and-loss statements to the detail general ledger — can be transmitted in real time. That's one of the major benefits we've been striving for: improved corporate communications," Adamo added.

AMEX from SR/47

order to load or reload software to one or more interface units.

Status display continuously displays the up-to-the-minute status of the cable, each bus interface unit and each port. The status is derived from periodic status messages and on-occurrence error reports from the bus interface units.

Network control commands allow the control center operator to set the state of a bus interface unit or a port, switch a device to a new port, switch to a backup interface unit, downline-load a particular program to one or more interface units, transmit specified interface information to the control center, copy the screen contents to the printer and control the logging and reporting functions.

Event logging includes the capture of status, error and alarm information and all operator commands and actions taken by the network control center. Logging can be to disk and/or to the printers.

Printed reports allow printing the contents of the status CRT terminal in three standard report formats.

Switch-over control handles switch over from the primary to the backup net control center in the event of a control center failure.

Bus interface unit parameter modification allows the network control center operator to use a mnemonic name to change the value of any parameter in the software of an interface unit.

Using the Acara network control center architecture, Siac can achieve any level of availability simply by increasing the number of control centers. Siac uses two active control centers and maintains a third for program development and hardware backup that includes all of the vendor's standard software development aids.

Eleven months passed between the active date of the Acara contract between Contel and Siac and the beginning of acceptance testing. Toward the end of that period, Siac and Amex made a gradual cutover to full operation. Occasional vendor support was required before full cutover could be made.

SPECIAL REPORT

Bank redesigns corporate net with CATV tech

PORTLAND, Ore. — When First Interstate Services Co. (Fisc), the communications services provider for First Interstate Bank (FIB), launched a massive redesign of its corporate data network, it teamed up with a cable television vendor. The resulting relationship was one of only a handful of its kind in the country.

Fisc handles communications services (voice and data) for FIB's 11-state network. Tom Findley, Fisc assistant vice-president, heads up the Oregon network supporting 170 branch banks, 35 of which fall within the geographic boundaries of Rogers Cablesystems, Inc.'s Portland CATV service area.

In 1981, Findley's mission was to deploy a corporate-mandated advanced communications facility for Oregon. This meant incorporation of new technology as well as the redesign of the Oregon network. At that time, Fisc was operating on two networks — one for automatic teller machines (ATMs) and teller terminals operating on seven backbone circuits to corporate headquarters in El Segundo, Calif., and a different network for the administrative services with backbones into Portland.

Rogers' involvement in cable-delivered data communications services was mandated by its 1980 franchise to serve the city of Portland. While the franchise granted residential service rights for Portland's East Side only, rights to provide business services on a B cable, or Institutional Network, were granted citywide. Operating on a separate bandwidth on the East Side's A-2 cable and built to order on the West Side of the city, Rogers' Institutional Network is now about 1,000 miles long and serves hospitals, schools and government agencies as well as banks.

In redesigning the Fisc Oregon network, all FIB branch banks reachable by cable were excluded onto their own analog network. "This was not accidental," Findley said. "We wouldn't have done it if we hadn't known that cable-delivered data service was possible." With the conversion of all of Portland's 35 branch banks to cable, Fisc would be able to drop three analog circuits without losing any branches.

Fisc's redesigned network has all nodes in Oregon, regardless of terminal type, coming into a central hub in Portland. Data is then processed through one multiplexed 56K bit/sec highway to El Segundo.

The idea began to become reality in July 1982 when, after eight months of preliminary planning, Rogers initiated service to Fisc with a 60-day demonstration using two terminal drops and a host drop operating at 9,600 bit/sec. The test simulated the activity of a remote branch 13 miles from the host. Findley said in a report following the demonstration: "In comparison with conventional analog circuits . . . [there was] a 100% reduction of recoverable errors and nearly a 40% reduction in nonrecoverable errors."

In 1983, a contract was signed for the conversion of all Portland FIB branches to Rogers' Institutional Network. Although delays in obtaining downtown underground construction permits have slowed the conversion, eight drops are now in place, and the remainder of the conversion to cable should be accomplished in 1984. The reliability figures stated in Findley's report still hold for that circuit, he said, but now Fisc is monitoring the performance of the new cable circuits closely.

Cable delivery also simplified Fisc's cost planning in that Rogers' data transmission price rates are based solely upon speed. The elimination of distance and usage sensitivity, Findley said, "changes the way you design the network. Cable allows us to deliver low-speed service to those who require only a low speed and to deliver high-speed service exclusively to those users who require high speed. This translates in a budget perspective to knowing — when we put a new branch onto CATV — exactly how much it's going to cost us for the next year, regardless of its usage."

Increased security is a further advantage of the Rogers technology and of the finite nature of cable coverage itself. According to John Rivenburgh, Rogers' Institutional Network manager, "The system is sweep-scanned by a Digital Equipment Corp. PDP-11/44 every 10 to 12 seconds. All amplifiers are polled, and status information is reported. Any illegal tap, unless the network has actually been cut, creates signal noise that is seen on the diagnostic equipment."

Findley said, "The way the network is designed and amplified adds a level of security we don't have on the analog circuits today. It is possible for somebody to tap into an analog circuit with common technology available today and eavesdrop on our data. Whereas on cable, any time a tap is made, it is detected that it has been done and that it is happening between two particular amplifiers."

Flexibility was another factor that

See CATV 39/64

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SPECIAL REPORT

PBX helps college, hospital keep costs down

EVANSTON, Ill. — Many corporations have found that one sure way to reduce operating costs is to purchase, rather than lease, their telecommunications systems. Industry experts predict that within the next three years, 75% of Centrex users who utilize more than 5,000 lines will make decisions to purchase their own systems. Some large corporations are even creating their own independent communications networks.

Northwestern University and Northwestern Memorial Hospital here have been working to create their own telephone company. That company is built around a Northern Telecom, Inc. SL-100 private branch exchange system. Scheduled to cut over in September 1984, this system will be the largest privately owned network based in the Chicago metropolitan area and one of about 12 of that size nationally. The 10,000-line system will link the Northwestern University campus and Northwestern Memorial Hospital facilities in downtown Chicago with the university campus here. It provides for voice, data and two-way video transmission.

A digital switch installed in Chicago will service approximately 6,000 lines in the 19-building complex there. Another 4,000 lines in 155 buildings on the Evanston campus will be serviced by a separate digital switching center there. Included with the system are a communications management center and Halon fire prevention systems at both switch sites.

In 1981, the university and the hospital jointly initiated studies to examine communications operating efficiency, cost control and maintenance. These studies concluded that significant cost savings could be realized if both institutions made a shared purchase of a telecommunications system.

Northwestern Telecommunications Services (NTS) will administer the installation and operation of the system for the participating institutions. Based on its research and needs analysis, NTS established several objectives for the purchase and installation of the telecommunications network. NTS wanted a system that:

- Is easy to manage.
- Requires a minimum of staff to operate.
- Can be quickly and easily installed.
- Allows control of time and costs in order to make adds, moves and changes.

The bottom line was, as always, the bottom line — Northwestern wanted to save money. Lee Ellis, senior vice-president for business and finance at Northwestern, projected that the university and the hospital would spend $50 million for telephone services over the next 10 years if they did nothing to reduce the expenditure. With the new system, Northwestern expects a total buyback in seven years and cost containment in the years ahead.

Because it was actually creating its own telephone company from the ground up, NTS wanted a vendor with experience in that area. Eight of the original 11 vendors who submitted bids for the Northwestern proposal were dropped because they were primarily manufacturers that were not directly involved with the operation of a telephone company.

The final choice of Centel Business Systems as the vendor was based on two factors: It is a subsidiary of Centel Corp., which operates the nation's fifth largest telephone company, and the Chicago area is Centel's largest operating service area.

NTS decided that experience would be vital to the engineering, installation and maintenance that would go into creating Northwestern's telephone network. In addition, Centel had experience operating the Northern Telecom DMS-100, a product similar to the SL-100.

A major concern for Northwestern was the necessity for continuous communications service to the hospital. Through the network, the hospital and university facilities in downtown Chicago will be hooked up to two central offices. There will also be another central office for the Evanston campus, so that three central offices service the system. To maintain communications in the event of a disaster or other potential disruption of service, the system will have dual power from two separate power stations, backed up by a four-hour battery source and a diesel generator. In addition, emergency stand-alone service will be provided should the main system fail.

The choice of fiber optics rather than a microwave application was also an effort to ensure reliability. Although the bid did not specify fiber optics, Northwestern chose it because it was seen to be more cost-effective and because of its greater capacity and greater reliability. Outside cabling will be installed along 13 miles of the existing Chicago and Northwestern Railroad lines between downtown Chicago and suburban Ev-

See NTS SR/54

CATV from SR/40

made CATV attractive.

"The planning and scheduling necessary to alter the host-dependent relationships of branches on the CATV network is much less than that of a comparable analog network," Findley's report stated. Fisc's teller and ATM network is a series of backbone circuits with dependent loops running between the host controller and remote teller workstations. This allows multiple branches to operate off one host controller.

When remote loops are CATV, one physical cable carries and broadcasts all signals throughout the network. "What we can then do," Findley said, "is designate a host controller with spare capacity for remote loops that is not used. Then, when a controller goes down someplace, all we need to do is go to the downed controller and reprogram the radio frequency modem there to the spare modem's frequency levels and — presto. We don't have the branch that's housing the controller up, but we've got the remote branches up."

The disadvantages Fisc has experienced with cable delivery are, in Findley's words, "not all that significant." There is, as in all DP shops, risk inherent in dealing with a new vendor. Problems tend to appear in direct proportion to the number of vendors employed. "We know," Findley said, "that the Institutional service is a new service for Rogers Cablesystems as well, and they need to learn to support that service differently than they support their residential service." Rivenburgh said that Rogers employs different response procedures, different monitoring procedures and different technicians to support Institutional Network service delivery.

Fisc's early projections show the cable vs. analog costs being about equal in hard dollars. CATV costs are projected based on a 9,600 bit/sec backbone service (twice the speed of the analog service) and a 2,400 bit/sec dependent loop service. Analog costs are projected based on a 4,800 bit/sec backbone service and a 2,400 bit/sec dependent loop service.

For the future, Fisc envisions using the cable network for applications beyond data transmission. Point-of-sale credit card authorization is one possibility as analog service increases in cost.

NTS from SR/52

anston. This was a faster, more cost-effective alternative to laying cabling under the shores of Lake Michigan.

In an effort to reach its objective of a quick and easy-to-install system, Northwestern used Centel as a general telecommunications contractor. Centel has taken on the responsibility for finding vendors for projects such as air-conditioning the private branch exchange rooms and construction of the rooms themselves and all other areas of the installation. Before launching into the system installation, Centel held several work-through sessions with Northwestern officials.

Inclusion of the communications management center in the system will allow Northwestern to exercise the management control over communications that it set out to achieve. Operating on a Data General Corp. MV8000 Series 2 with 2M bytes of memory and 354M bytes of disk storage, the communications management center will include data collection and report generation, data base management, directory assistance and maintenance and status reporting. These features will be helpful in reducing usage costs and in quickly locating and correcting any problems with the system.

The Northwestern system will also have twisted-pair cable to allow for voice and data integration at every location. Almost 1,000 data terminals will be interfaced upon cutover in September. Currently, 95% of the plant engineering is complete.

SPECIAL REPORT

Voice/data PBX at core of transparent net

By Tom Rizzo
Special to CW

Change is upon the information management world like a rising tide of never-ending bits and bytes. However, the basic need or premise for the information managers who try to control this seemingly chaotic onslaught remains the same: that is, to determine application needs in order to choose the right information conduit. It's never been more necessary to realize that the application determines the network.

The past several years have seen the coming of word processing, office automation, information centers and personal computers all within the office business environment. This might be called the micro environment pertaining to business information networking.

On the macro scale, we've seen the rapid growth of value-added networks and the emphasis on digital as opposed to analog methods of communication to interconnect various information nodes on a predominantly nationwide business scale.

And now the official breakup of AT&T in the U.S. and the development of national digital networks are leading toward universal information handling.

Specifically, the word processing/office automation arena showed management how information could attain the status of a commodity with intrinsic value. This monetary orientation within this environment is still being developed with the realization that the private branch exchange (PBX) can be used as the controller for office information management.

Information centers served an extremely useful purpose because they began to break down the barriers between word processing and data processing on both the end-user and MIS level. The end user realized he could use a computer, and the computer expert became aware of the business profit-oriented area.

Personal computers now are everywhere and, combined with integrated voice and data PBX, are forming the networking tentacles necessary to exploit a universal and versatile information network.

So what the business world is witnessing is a total entwining of communications and computer technology that embraces the office, the home and the public sector.

Among the various kinds of computers and office equipment available, the telephone instrument or system obviously is the most commonly used apparatus. This being the case, a universal and versatile information network should be developed using this device that could embrace all applications ranging from conventional telephone switching to very high-speed data link categories.

This development has to take place within the micro world of the office environment, or else the macro and universal networks simultaneously being developed will leave this cluster of automation, called the automated office, an isolated island.

Let's concentrate now on this office-oriented telephone environment. If the phone system is to be the information hub, it must handle not only voice, but data, text and image.

This local phone-based network must handle various kinds of communications, each having different traffic characteristics, such as holding time, data transfer rate, protocol conversion, format translation and so on. The local communications network must, therefore, include transmission, switching and data processing technologies.

But the network cannot stop at this point because it must adjust to different end-user-dictated sizes, from a small-scale network in an office building through intrapremises networks to a nationwide or international interpremises network.

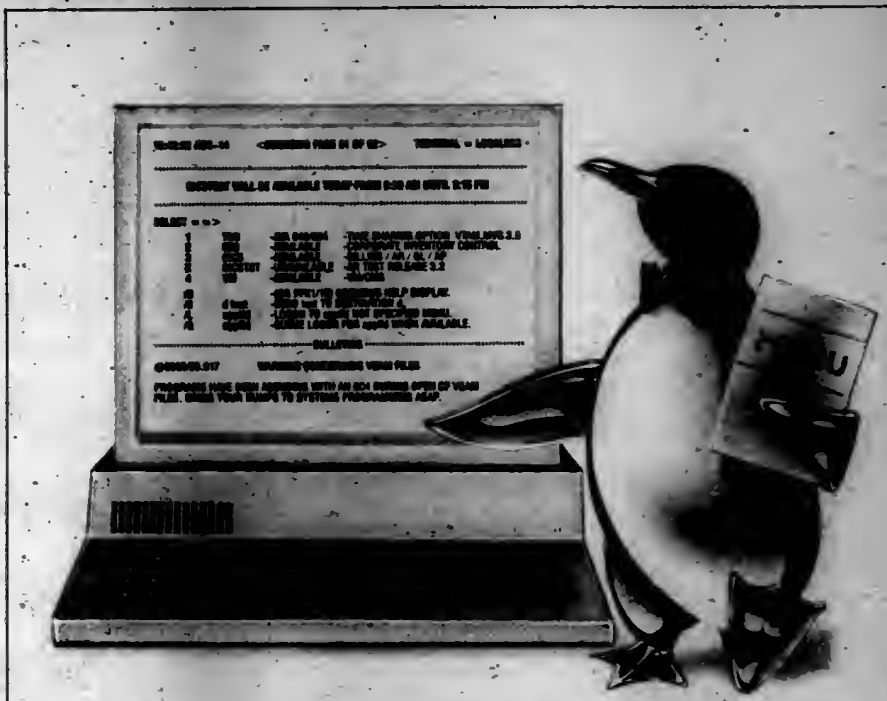
Currently, it appears as though no one technology or architecture can do all that is required from the standpoint of technical feasibility and cost-effectiveness to satisfy all network users.

But one thing is becoming exceptionally clear. The integrated voice and data PBX that includes applications software combined with coaxial cable/fiber-optic extension is the foundation, or cornerstone, upon which to build a versatile micro information network that is macro- or wide-area-network-oriented while being universal in scope.

Therefore, the base PBX controller system would accommodate, in reality, three types of internetworking subsystems: the high-transfer 30 bit/sec or more optical fiber loop, the medium-transfer 10M bit/sec or less baseband coaxial cable system as well as the low transfer speed twisted-pair telephone cables that are found in most offices today.

This, coupled with packet-switching techniques and network tandem capabilities, should be what is necessary to form a universal and versatile information network transparent to the end user.

Rizzo is chief executive officer of RFC Systems Integration, a Dallas consulting firm.



SPECIAL REPORT

Boston leaning toward broadband cable nets

Could ease daily operations, reduce long-term capital costs

BOSTON — Technology advances over the past 10 years, coupled with the acceptance of CATV, will soon benefit the city of Boston. Broadband-based data communications are being used to alleviate crowded wiring conditions in many of Boston's older buildings, expand data processing services and provide information processing to a growing number of subscribers.

In 1969, then-Mayor Kevin White commissioned a study on the feasibility of CATV for the city of Boston. The commission reported that the technology was not mature enough to serve the city's diverse needs. Ten years later, the mayor commissioned another study, and this time the results were positive.

CATV had been installed successfully in other cities throughout the U.S. The popularity of CATV was enhanced by entrepreneurs like Ted Turner, and technology had been developed to increase the number of channels available to the general public. The available bandwidth for CATV had expanded from less than 300 MHz to over 450 MHz — allowing for an increase of between 30 and 52 new television channels. New applications had been developed that used the same television cable hardware and radio frequency as CATV, but with the added advantage of being designed for two-way data communications rather than video distribution.

Before these developments, most data communications installations were either tied in to twisted-pair IBM. The latter approach, the IBM 3270, consisted of point-to-point connection between 3274 cluster controllers and 3278 baseband coaxial cable. However, a problem occurred because the cable used in these configurations — RG-62 A/U — had a characteristic impedance of 93 ohms, which differed from that used for CATV. Another dilemma was the vast amount of wiring that existed in many of Boston's older buildings, which left no room for additional wiring for new services.

Broadband data communications was looked on as a possible alternative, since the technology was immune to twisted-wire problems such as the difficulty of relocating equipment and susceptibility to electromagnetic and radio frequency interference and ground loop problems. Another favorable aspect of broadband technology was that a single piece of ¼-in. coaxial cable was comparable to over 50,000 twisted pairs of wires in terms of capacity.

Until broadband-based data communications began to attract the attention of potential users, the most popular method of sending information from one point to another had been modems. However, that method had no provisions for error detection and correction or circuit switching.

After weighing the possibilities of broadband data communications, the Boston commission gave a positive recommendation of CATV to the mayor. The process of awarding the franchise began, and in 1980, Cablevision Systems Development Co. was selected as the CATV operator for the city of Boston.

Three developments influenced the commission's decision. Digital Equipment Corp., Xerox Corp. and Intel Corp. jointly announced Ethernet, and more importantly, Intel pledged to develop custom-integrated circuits for implementing the access technique known as carrier-sense multiple access with collision detection (CSMA/CD).

A second factor was the development of a reliable, low-cost and frequency-agile broadband-based radio frequency modem by Network Resources Corp. The third factor was the development by Sytek, Inc. of a protocol for a broadband-based, packet-switched network using CSMA/CD as the cable access.

The cable network consists of four separate cable systems: S1, S2, I1 and I2. S1 is the basic CATV video distribution system. S2 is a video distribution system with additional programming and movies for extra fees. I1 is the public institutional system, while I2 is controlled by Cablevision. Both I1 and I2 allow an equal amount of bandwidth distribution in both directions in the same cable. They are also designed to support two-way video and data communications simultaneously. These multiple video channels can be used for different program material, and multiple data channels can be used for different data communications at the same time.

The data communications requirements for the city of Boston began with communications within a building. The typical DP center was provided with emergency standby power, fire extinguishing systems, air conditioning and a series of ducts or wireways that lead to other parts of the building. Some of the problems that could arise range from central processor failure, resulting in loss of processing resources to all users; processor power being used for I/O and communications control instead of a distribution of resources; and space limitations.

Whether the traditional or newer techniques or combinations of both are used, an intelligent communications network can result in significant savings both in daily operations and in long-term capital costs.

Boston's City Hall, an eight-story complex, has a computer room on the first floor that includes an IBM 3033, disk drives, high-speed printers, a 3274 cluster controller and a 3705 communications controller. There is a DEC PDP-11/70 on the seventh floor. Other equipment includes Wang Laboratories, Inc. distributed word processing systems, IBM Displaywriters and several IBM Personal Computers.

Currently, the duct space into the computer room is exhausted, and additional duct space is too expensive.

In addition to supporting intra-building data communications requirements, the City Hall DP department is also responsible for support-

See BOSTON SR/80

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Moving firm 'relocates' with distributed DP

GLENDALE, Calif. — With nearly 100 years experience, the Bekins Co. based here is one of the oldest moving companies in the U.S. In the late 1970s, when the company decided to change its method of centralized bookkeeping and recordkeeping, it chose to move some of the processes out to field locations, using a technique that had recently come of age — dispersed data processing.

Bekins is one of the world's largest local, long-distance and intrastate moving and storage firms. Services include the transportation and warehousing of household goods, office and industrial equipment, electronics, business records and air freight forwarding.

Management of these businesses — subsidiary companies that generate $325 million in revenues annually — requires extensive accounting procedures including accounts payable, accounts receivable and general ledger. Bekins uses dispersed data processing to collect the necessary information from its 150 locations across the country.

"When we first started using automated data processing in the early 1970s, we had two computer sites, one in Chicago and one on the West Coast," said Robert Forstrom, MIS vice-president. "It was a classic situation of central sites serving subsidiaries from each city. The data processing was later consolidated in Glendale, where data was entered interactively or on-line batch to an IBM mainframe from information supplied by the subsidiaries."

During the mid-1970s, Bekins acquired a number of other companies. "Some had their own computer systems," Forstrom continued. "Others were using service bureaus for data processing. It became apparent that Bekins would have to standardize its operations and move data processing out to the field locations. Even though we wanted to give the field that control, the cost of on-line processing from various locations was high."

Bekins' various locations today include 40 company-owned offices and 350 independent U.S. agents. Of this total, 150 now have dispersed data processing equipment in offices across the country supplied by Datapoint Corp. The Datapoint Small Business Computer systems, which consist of a desktop microcomputer, 64K bytes of memory, a 2M-byte diskette drive and a communications interface for each system, collect and process data which is later transmitted via GTE Telenet Communications Corp.'s Telenet to the Bekins IBM mainframe here.

"At first we weren't sure if we should keep the data processing centralized, regionalize it or totally disperse it. We knew we had to satisfy the needs of the smaller subsidiaries, allowing them to do some basic financial processing. Yet we wanted to keep a large mainframe in Glendale to consolidate the accounting, payroll and business data the subsidiaries would generate," Forstrom said.

"A larger problem was this: How do we collect the resultant data concurrently from 150 locations across

See BEKINS SR/60

Bekins distributed processing system


niLINK

BEKINS from SR/58

the country (including our offices and a portion of the 360 agents we had at the time)?" Forstrom continued.

Decentralizing the data processing operations was selected for two main reasons. It avoided the time delay caused by sending paper through the mail, and it gave the subsidiary offices more control over their data.

"Each business is a profit center that can generate more profit by controlling its costs. Using distributed computers has saved Bekins more than half a million dollars in costs," Forstrom said.

"The offices with Datapoint computers can dial up Glendale at any time. The dial-up and batch transmission features were part of the cost justification for buying Datapoint equipment.

"In the past, the offices had hard-copy terminals. When they were ready to send data to Glendale, they dialed the number and then began to key data. We were paying connect charges all the time. Now the offices key in the data off-line and then batch it all to Glendale," he said.

An automatic process takes over on an IBM host here. Forstrom explained that the transmission causes data to be stored on disk for the host to process overnight. The result is billing and accounting for each Bekins service, including general ledger and payroll.

The types of applications Bekins is developing are as diverse as Bekins' services.

One universal application Bekins runs is its interstate on-line scheduling and dispatch system for management of a nationwide fleet of household moving trucks. Forstrom reported that 90% of the Datapoint processors installed across the U.S. enter data into that system.

Four Bekins staff programmers developed all the software, using the Dataprints business programming language. Bekins also designed an applications generator program for systems development using a small Datapoint Attached Resource Computer local-area network, which allows up to 255 processors to share the same disk files and other peripherals.

Bekins has a technical services group that is responsible for training and installation. The first 50 Datapoint sites were installed by two Bekins technical representatives who personally delivered most of the computers during a cross-country tour.

Training was done at the site on the actual computer that would be used. As more applications are developed, training continues to be done on site. The majority of users are clerical personnel.

BOSTON from SR/56

ing remote, off-site data processing. In-house processors are used with off-site terminal equipmment connected via telephone lines on a dial-up basis. The existing phone users include the public school system, the police department and the fire department. These telephone lines dump into the 3705. The primary application is administration, but some of the resources are used by the school system for teaching.

This alone is not enough to justify the installation of broadband-based local-area network technology. The reasons behind Boston's decision also include the following: Broadband supports multiple users; the technology is vendor-independent; the capacity of a single coaxial wire is enough to replace 50,000 twisted-wire pairs, relieving duct space crowding and allowing for future expansion of broadband wiring.

Boston is currently evaluating Localnet 20, a broadband-based data communications system manufactured by Sytek. It is expected to save money for the city on modem rental charges, remove the modem bottleneck and allow any authorized user access to the resources of the local-area-network-based system.

The manager of information systems planning for the city of Boston, Jerrold Patz, developed an application for accessing the IBM system. Rather than use an IBM 3270 display station, which must be directly connected to a 3274 control unit with dedicated point-to-point wiring and cannot be used with any other system, he is replacing the 3278s with dumb teletypewriter-type Ascii asynchronous terminals that have 3278-like keyboards. He has attached a protocol converter to one port of the 3705 via RS-232, through which up to 24 users can be served.

Current applications include IBM's TSO and CICS. The same terminal can be used to access the PDP-11/70 on the seventh floor. The dumb terminal approach costs approximately $1,000 for each terminal — compared with the $4,000 price tag for the 3278s. The existing 3278 terminals are leased, so removing them will save the city approximately $3,000 per terminal. The elimination of the 3278s also means that a 3274 is no longer needed and no additional wiring is needed.

The final step after City Hall has proven the technology and demonstrated the methodology of broadband-based data communications is for Cablevision to offer data communications on the commercial and institutional cable system, I2.

SPECIAL **REPORT**

College nets must keep pace with info needs

By Albert L. Harris
Special to CWS

The influx of networks into the college and university environment is beginning to accelerate. Several schools have taken an evolutionary approach to the opportunity afforded by this capability. Networks are not just for students, but rather a tool for the entire institution, especially faculty and staff.

Demand and reliance on computer resources at every college and university are at an all-time high — and increasing. Most students expect computer training as part of their education. It has not stopped at the student level either.

To keep pace with the students, most members of the faculty are requiring access to computer resources. To keep up with the faculty, the staff is demanding access to the latest in technology. As needs increase, networks are providing the solution.

College networks are being created to meet the needs of institutions with a large number of terminals and microcomputers. They also must meet the communications needs of such environments. Two types of networks are being used and developed. Neither type is fully developed to allow users maximum use of the resource. The two types are microcomputer networks and mainframe-based networks.

Microcomputer networks are communications links that connect large numbers of microcomputers and other peripherals and storage equipment. They usually include communications (networking) cards, containing communications software used to control the entire network; storage devices, including Winchester disks, cartridge tape and floppy disks; and printers, plotters and other hard-copy media.

When part of microcomputer networks, individual microcomputers do not have to have a floppy or hard disk capability. This allows colleges to keep the costs of microcomputer networks low. Program and data libraries are maintained on the system's disk storage. Peripheral and storage devices can either be dedicated to one user or be used as system resources.

Currently, microcomputer networks are being used by several colleges for instructional use. Some schools are also using this concept for administrative data processing. The concept requires a substantial communications network.

The advantages of the microcomputer network in a college environment include low initial cost, centralized data storage and unlimited expansion. The disadvantages of this approach include limited disk capacity and limited vendor support.

Mainframe-based networks rely heavily on the central computing capability or on another central processor. Here, the mainframe acts as the system controller and data manager. Access on mainframe-based networks in colleges is through hard-wired terminals and dial-up capabilities. If a user operates a microcomputer, it usually acts like a dumb terminal.

The ultimate capability is for the microcomputer to be able to access data as stored on the mainframe's disk and use its microcomputer capabilities to execute the programs and manipulate the data.

In this manner, the host mainframe and the users' microcomputers can access the data, given the proper security, as if it were a standard file. This type of network capability would allow colleges and universities to maximize the capabilities of both the mainframe and the microcomputer.

The advantages of this type of network in a college environment are centralized storage and control and data compatibility and accessibility. The disadvantages of the mainframe-based network are cost and the fact that different mainframe manufacturers maintain different communications standards.

Several colleges and universities are approaching the solution from a mainframe-based network. These schools are generally setting the standards or dictating the microcomputer that will be used to reduce communications protocol and data storage incompatibilities. Usually, the standard revolves around the mainframe manufacturer's network software packages and capabilities.

Networks are needed to support the college environment in three important application areas. These are: office automation, faculty needs and staff requirements.

Office automation is usually the first application that is implemented on a network basis. Office automation includes access to information, communications, document generation, personal computing and personal management. Office automation functions are usually justified through an increase in productivity.

Access to accurate and timely information is one of the primary advantages of the network concept. By creating networks, individual users

See PAGE SR/52

The use of networks in colleges and universities has come a long way since the days of traditional data processing. Because of their potential in everyday college life, networks are here to stay. It is incumbent upon colleges and universities to take the lead in the use of networks.

PACE from SR/61

will have access to the needed information in an understandable format.

Document generation includes word or text processing, but goes far beyond the simple clerical tasks most people think of today. Professional faculty and staff will find it easy to input text, especially internal documents, access student papers and information and create research papers.

Faculty needs are the second set of applications that should be a part of the college network. Faculty applications include the availability of office automation tools, support for research and tools for increasing teacher productivity. Faculty will use many of the applications available.

Support for research will include the technical, data gathering and data storage and handling needs to support the research efforts of faculty members. Statistical packages must be a part of the network. Microcomputers will be a big aid in supporting the data handling and minipulation needs of research.

Finally, tools for increasing teacher productivity will be part of the college or university network. Examples of faculty tools are computer-aided instruction and computer-managed instruction. Tools must be available to assist individual faculty members to create automated teaching aids and assist in grade retention, filing and computation and recordkeeping and reporting. Use of the college network will mean all faculty members access and use the same data bases and programs to increase consistency in recordkeeping tasks.

The final focus will be on staff requirements. Areas such as institution research, decision support, alumni and development and job placement are just a few examples. Many of these applications are computerized now, but their inclusion in the network will enhance their usefullness. As with the other applications, access to college or university data will expand the ability to perform these tasks.

The use of networks in colleges and universities has come a long way since the days of traditional data processing. There are more improvements to come. Because of their potential in everyday college life, networks are here to stay. It is incumbent upon colleges and universities to take the lead in the use of networks.

All the tools, however, are not available now. We are on the verge of technological breakthroughs to allow maximum use of the networked environment. Common data and programs and the communications link between microcomputers and possibly one or more mainframes provide the real advantages of networks.

There will be problems, but those problems will lead to opportunities and those opportunities to innovation. Colleges and universities must keep pace with industry in the area of network systems to prepare students better.

Industry is marching toward communications networks that will link managers' and professionals' microcomputers to each other and to the corporate data bases. Toward that end, networks must go to college if colleges are to be the training grounds for the next generation of information users.

Harris is president of Management/Systems Advisors, Inc., an Atlanta-based firm specializing in university DP planning, acquisition and usage.

SPECIAL REPORT

Multinational turns from 10 vendors to one

MEMPHIS — In mid-1981, the International Consumer Products Division (ICPD) of Schering-Plough Corp., based here, determined that its 10-vendor computer environment (and spiraling information systems costs) needed to be replaced with a systems architecture that would better meet the present and future needs of ICPD, a division with international operations scattered worldwide. Schering-Plough is a diversified manufacturer of pharmaceuticals and consumer products, including Coppertone suntan lotion and St. Joseph's aspirin.

The plan would necessitate a complete revamping of all computer application systems and a retraining of all systems personnel.

In addition to high systems costs, ICPD had no ability to share resources, to have cooperative systems development projects or to implement a cost-effective communications facility, due to the 10-vendor environment. As a result, costs were increasing, efforts were duplicated, productivity was low, and there was little systems documentation.

It was the spiraling costs that prompted ICPD to look closely at its worldwide systems situation. Also, the division realized that worldwide communications networking would eventually be a necessity, and that a standard architecture would be a tremendous asset in making such a network a reality. The general inaccessibility of computerized data — along with the cumbersome means by which key operating data was being sent into ICPD (Telex, followed by a labor-intensive rekeying effort) — simply dictated that the entire situation be reviewed.

Two major efforts

So, there were two major efforts that were put on the drawing board: a project to standardize computer hardware and software and a project to provide access to computer systems and data bases on a worldwide basis. The computer hardware chosen for the majority of ICPD's sites was the IBM System/38, with the System/34 and System/36 designated for the smaller ICPD businesses.

The system packages chosen included the McCormack & Dodge Corp. G/L system; IBM's DMS/38 customer service applications (order entry, receivables, sales reporting); and Arthur Andersen & Co.'s Mac-Pac manufacturing system.

As the division headquarters' financial reporting requirements increased fivefold, an IBM System/38 was implemented. This System/38 served not only as a vehicle for customizing the above packages for the division's offshore sites, but also as the financial consolidation and planning system for ICPD staff-level personnel.

Since beginning the computer hardware standardization project in mid-1981, ICPD has installed System/38 computers in Memphis; Toronto; Grosspetersdorf, Austria; Dusseldorf, West Germany; Caracas, Venezuela; London; and Basel, Switzerland. It has also installed System/34 computers in Sydney, Australia, and Johannesburg, South Africa.

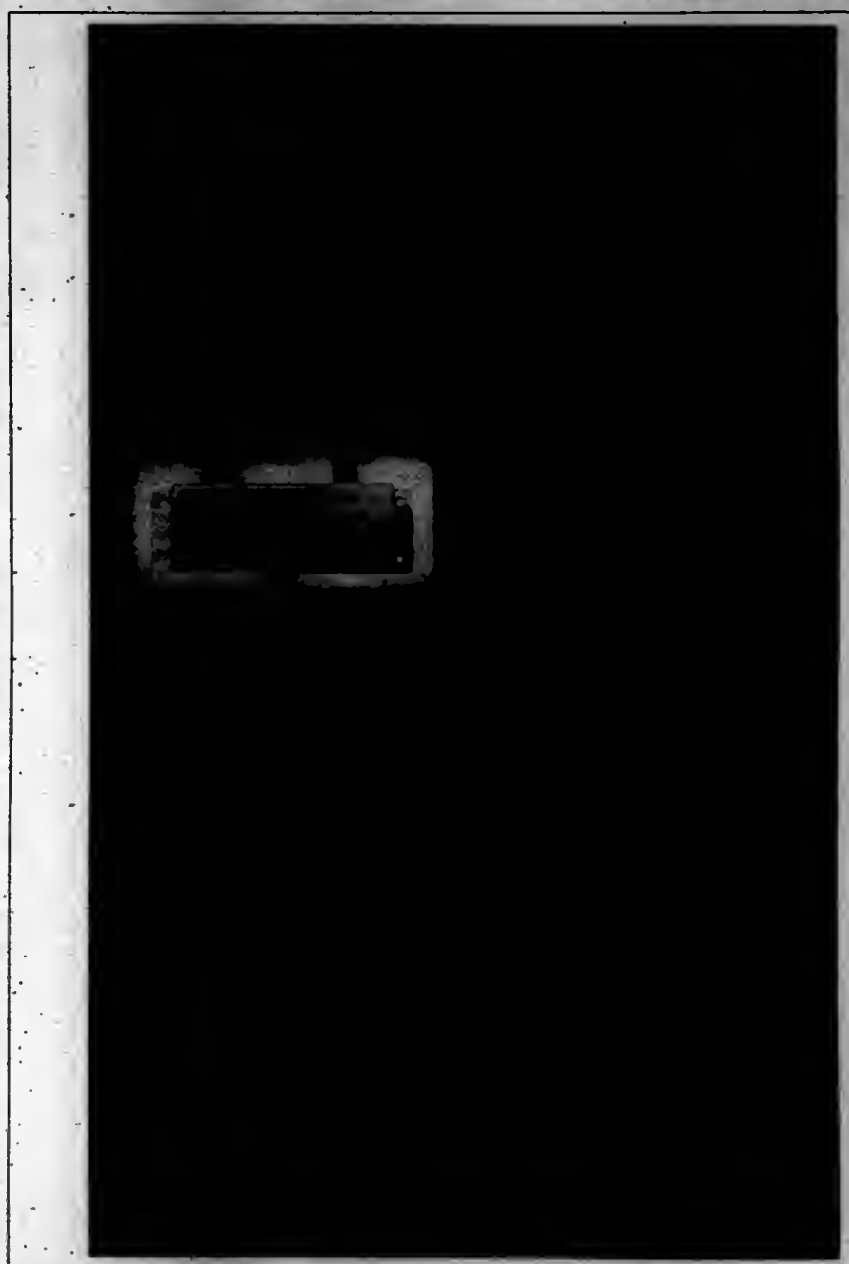
ICPD has assisted four of its smaller businesses in their transition to the world of automation via outside DP service bureaus. It has scheduled System/38 installations for Stockholm, Mexico City, Frankfurt and Paris over the next 12 months, and another six international installations have been scheduled for 1985. By the end of 1983, ICPD had reduced worldwide information systems staffing by 32%, and had provided 1982-1983 accumulated cost savings of $1.27 million in the information systems functions alone.

While the overall divisional systems architectural direction and the selection of the System/38 were originated by the ICPD staff, each business unit information systems group provided the "horsepower" needed during the implementation/conversion process.

Not only did costs come down, but the quality of the divisionwide information systems functions (as well as the applications systems) increased dramatically, and cost benefits began to accrue in areas other than information systems. Substantial cost reductions, totaling hundreds of thousands of dollars, have been targeted divisionwide in general administrative areas and in manufacturing/inventory areas.

In response to the problem of not being able to get subsidiary data effectively and efficiently into the ICPD system, an IBM Series/1 communications minicomputer was installed to act as a front-end system to the System/38 general-purpose computer.

Via a Series/1 software package, Systar Corp.'s Gateway, the Tymnet, Inc. international packet-switch communications network and an IBM 3101 CRT, to be located at each offshore subsidiary, each of the business units will have access to the Memphis-based host in an on-line mode for the purpose of inputting financial, operating and planning data.



SPECIAL REPORT

Firm's local net yields unexpected benefits

FRIDLEY, Minn. — Although a manufacturing firm here is still in the early growth stages of its local network, a number of unanticipated benefits have been realized.

The standardization of terminals, printers and modems on the network has allowed the firm to leverage buying power through large-scale purchases, but has not forced it to rely on a given manufacturer or type of device.

The company — Medtronic, Inc. — is a manufacturer of implantable medical devices. The largest manufacturing site and the location of the corporate MIS function is the Rice Creek facility in this Minneapolis suburb. The facility consists of three buildings connected physically by a tunnel and a skyway.

A single terminal connected to a network interface unit has access to many different processors, from micros to mainframes. Cabling requirements have been considerably simplified and standardized.

Medtronic's central data processing configuration consists of a Sperry Corp. mainframe, a Prime Computer, Inc. supermini and an IBM System/38. Medtronic also supports some two dozen IBM System/34s and 36s distributed worldwide at remote manufacturing and sales sites and linked to the central Sperry by a batch communications network on dial-up phone lines.

During the construction of the newest building and the skyway, a dual broadband coaxial cable was installed in parallel throughout the facility. Although one cable is used primarily for video and audio and the other for data, they differ only in the location of taps, so that either cable can be used simultaneously for both data and video, thus providing a measure of backup redundancy.

The Sperry and Prime machines first made use of the cable for workstation support through radio frequency modems and multiplexers. Before a true local-area network area utilizing general-purpose gateways to the transmission medium could be implemented, a measure of peripheral standardization had to be achieved since the Sperry and IBM processors each use their own incompatible synchronous protocol and the Prime communicates asynchronously.

Asynchronous peripherals were chosen for their low cost and superior compatibility with different network architectures, which necessitated protocol conversion for the synchronous Sperry and IBM processors. After considerable research and testing, a Kaufman Research Manufacturing, Inc. converter was chosen for the Sperry and a Perle Systems Ltd. for the IBM machines.

For compatibility with the protocol converters and wide market selection, the Digital Equipment Corp. TE100 terminal protocol was chosen as the network standard. However, the nature of the network is such that a wide variety of asynchronous devices are easily supported.

To provide the general-purpose gateways to the network, 3M Corp.'s LAN/1 network interface unit was chosen. The ultimate architecture of the network is a logical token-passing ring imposed on the physical bus structure of the cable, with more than enough bandwidth.

There were a number of unanticipated benefits in some formerly unrelated areas of the operations, many of which grow out of novel combinations of hardware made possible by the peripheral standardization realized as a part of network implementation.

Annual seminars

Once a year the central MIS groups present a week-long seminar for the Medtronic worldwide data processing community to chart a course for the coming year and to promote a face-to-face interchange of ideas.

Since the broadband cable system is available in the meeting rooms that were used for the presentations, the data processing resources of the entire Rice Creek installation were available.

One of the talks was concerned with the IBM System/36, and the speaker was able to illustrate some points by signing on to the machine in the data center.

Rather than using a standard terminal, however, the company used an IBM Personal Computer running a terminal emulation program. The Personal Computer's video output was used to drive three large-screen projector TV sets so that everyone in the room was able to see the examples easily.

The Personal Computer was also used as a presentation device in lieu of a standard slide or overhead projector, again displaying the images on the large-screen TVs.

A second interesting application for data transmission and peripheral interconnection is computer-aided education. Various departments within MIS give classes on the different hardware and software tools available within the company.

Typically these have consisted of lectures given in a classroom equipped with an overhead projector, followed by hands-on sessions at whatever terminals happen to be free, as the instructor tries to keep track of where the students are and vice versa. By placing a network interface unit and a protocol converter in the classroom, giving the instructor a Personal Computer connected to a large-screen TV and each student a terminal, lecture and lab can be combined and questions and answers shared.

A general-purpose, multifunctional network can provide far more than simple computer connectivity and peripheral sharing. It can lead to new connections between formerly unrelated areas of the company. The network can also be fertile ground for the germination of ideas.

Medtronic has done some initial experiments with combined video and data video cassette recorder-based computer education. It is possible to distribute data processing into the homes of employees using inexpensive equipment and dial-up phone links.

Its sites worldwide are making use of the protocol conversion lessons that were learned during the network installation. And the network continues to grow and suggest new uses for itself.

SYSTEMS & PERIPHERALS

Whatever happened to IBM's FBA?

By Tom Hoshel
CW Staff

Shortly after it announced its long-awaited 4300 series of processors in late 1979, IBM dropped another bombshell on the computer industry. This time it was a new way of storing data in disk drives.

Fixed block architecture (FBA) differs from the traditional count key data (CKD) storage format in that it divides the memory tracks on disk drives into 512-byte blocks. While FBA does not give users the freedom to decide where on a disk platter information will be stored, many industry watchers feel that in the long run, FBA is more efficient than CKD because it greatly reduces the amount of disk space used for internal housekeeping functions.

When FBA — and the 3370 disk drive with which it was introduced — was announced in 1980, many industry watchers said IBM had created a new standard for data storage. But now, more than four years later, IBM has done relatively little to bolster the technology. In fact, the two big system disk drives announced since the 3370 — the 3375 and the 3380 — use the CKD format.

IBM statement in support of FBA

Perhaps the only strong statement IBM has made in support of FBA came last September, when it announced four enhancements to the 3370 line [CW, Sept 19]. The enhancements boosted the maximum capacity of a 3370 drive by 27% to a maximum of 730M bytes.

But nearly a year before that announcement, back in October of 1982, IBM had announced a no-charge feature for the 3310 and 3370 drives which appeared to offer users a migration path away from the FBA format and back to the CKD format [CW, Oct. 25, 1982]. The option allowed FBA drives to emulate the CKD formats on the larger IBM drives.

An IBM spokeswoman said IBM still considers FBA a viable part of its product line, but she would not elaborate on IBM's future plans for the recording technique.

Fred Moore, manager of corporate systems engineering for competitor Storage Technology Corp., said that to date FBA has not been one of IBM's more popular items. In fact, according to Moore, a lack of demand for FBA devices prompted STC to stop production of its IBM-compatible 3370 look-alike, the 8870.

Currently, Memorex Corp. is the only compatible peripheral manufacturer making a 3370-compatible product (its 3690). Control Data Corp., the third major vendor of IBM-compatible peripherals, never offered a 3370-compatible disk drive.

However, STC's Moore contends that FBA is not dead, but merely resting up for another grand appearance — possibly later this year in the form of a new top-of-the-line disk drive. It was the timing of the 1980 FBA announcement and not the concept itself that contributed to whatever acceptance problems IBM may be having with the storage format, he maintained.

Moore explained that storing data in the FBA format requires users to convert from a CKD environment. How difficult and how expensive that conversion is depends on several factors, such as the amount of data that has to be converted.

In general, however, the conversion tends to be fairly easy for users of IBM's Vsam, Moore said. For users of other IBM access methods, the conversion is much more difficult.

Moore pointed out that there are many more Vsam users today than in 1980, when FBA came out, so the market may be ripe for an FBA revival.

Jeoff Seabrook, director of marketing for Memorex, thinks the FBA revival is already here. Like STC, Memorex decided to get out of the 3370 market, but the firm's international divisions insisted it continue to market the 3690.

"That proved to be one of the more fortunate decisions we've made," Seabrook said, predicting that Memorex could probably sell twice as many 3690 drives as it can produce.

"The market seems to be getting stronger and stronger," he added, noting that sales of 3370-compatible devices are outstripping sales of 3375-compatible products by 4:1. "It's a nonglamorous product, but we're making a lot of money."

With many IBM watchers predicting that the company will announce a larger capacity version of its top-of-the-line 3380 disk drive (currently a CKD device), STC's Moore said a double-density or quad-density 3380 drive would be an ideal way for

See FBA page 78

INSIDE

Harris to offer gallium arsenide-based circuits

MILPITAS, Calif. — Harris Microwave Semiconductor, Inc., a division of Harris Corp., claimed to be the first semiconductor house to offer commercially available circuits based on gallium arsenide technology.

The firm announced two products that are said to be five times faster than similar circuits based on conventional silicon technology: a universal shift register and a binary counter. The firm expects the strongest appeal for devices from developers of very high-speed signal processing, test instrumentation, computing and telecommunications applications, Harris said.

The gallium arsenide circuits are available immediately and cost about $325 each in quantities of 100. The spokesman said similar silicon-based devices cost between $20 and $40 each; however, they are not as fast as the gallium arsenide units.

Harris Microwave Semiconductor is located at 1590 McCarthy Blvd., Milpitas, Calif. 95035.

Calma introduces workstation based on Apollo CPUs

SANTA CLARA, Calif — Calma Corp. has introduced a workstation for the design, analysis and simulation of digital electronic circuits and components.

Called Tegastation, the product is based on 32-bit Apollo Computer Corp. nodal processors that use Apollo's Domain local-area network, a spokesman for the company said.

Tegastation features the following software:

- Taskmaster — an interactive graphics editor for constructing schematics for a variety of design uses, including printed-circuit boards and integrated circuit designs.
- Texsim — a technology-independent logic and design verification simulator for integrated circuit and printed-circuit-board design.
- Tscope — an interactive waveform display processor of simulation results in analog form.
- Texout — an interactive program that allows the user to obtain printed reports of simulation output in truth table or character waveform displays.
- Tnet — an integrated communications link that allows data transfer between the Tegastation and a Digital Equipment Corp. VAX-11 superminicomputer.

There are two Tegastation models: the DN300 with a 24M-byte disk and the DN420 with a 156M-byte disk, according to the company spokesman.

The DN420 system can be expanded with additional memory, peripherals and communications capability to act as a file server and/or communications gateway for a ring of Tegastations, according to the the company spokesman.

Prices for Tegastation begin at $50,800, the company spokesman said.

Calma is located at 2901 Tasman Drive, Santa Clara, Calif. 95050.

SYSTEMS & PERIPHERALS

Masscomp MCS-537 bows

WESTFORD, Mass. — Masscomp has introduced the MCS-537, a higher capacity configuration of its 32-bit Unix-based MC-500 series computer systems.

The MCS-537 features a 474M-byte Fujitsu Ltd. Eagle Winchester disk drive and a Cipher Data Products, Inc. vacuum-column ¼-in. magnetic tape drive. The Fujitsu drive has a slip-sector capability that is said to relocate bad blocks of data automatically.

The Cipher tape drive records information at either 800 or 1,600 bit/in. and can read/write at a speed of 125 instruction/sec.

A typical configuration of the MCS-537, supporting up to 16 users, is priced at $71,000. The configuration includes a 32-bit virtual address CPU, with a 4K-byte cache memory and 1M-byte error-correcting memory; Unix System III with Berkeley 4.2 extensions and Masscomp's Real-Time Unix software enhancements; Fortran and C languages; three RS-232C serial lines; and single disk and tape drives.

The mass storage devices may also be purchased separately as upgrades to any MC-500 system. Prices are $32,000 for the Fujitsu Eagle and $16,000 for the Cipher tape drive. Other options for the MCS-537 include additional storage, process controller and graphics display terminals and software.

Masscomp is located at 1 Technology Park, Westford, Mass. 01886.

TURNKEY SYSTEMS

STRATUS COMPUTER, INC. APPLIED COMMUNICATIONS, INC.

Base 24-atm system

Stratus Computer, Inc. and Applied Communications, Inc. (ACI) have announced the availability of ACI's Base24-atm processing and switching software on the fault-tolerant Stratus/32 Continuous Processing System.

The Base24-atm system was designed for financial institutions requiring medium- or small-size automated teller machine (ATM) networks. It reportedly provides fail-safe operation and on-line availability 24 hours a day, seven days a week. It allows an institution to provide customers with electronic funds transfer services through a proprietary network and through sharing arrangements with other institutions and national ATM networks.

Features of the software include a variety of transactions, three types of authorization, a settlement and reporting module and the capability to switch transactions into national and regional interchanges.

A full configuration of Base24-atm costs $140,000 and is available from ACI. An entry-level 4M-byte Stratus System/32 costs about $140,000 from Stratus. It includes one to two terminals, 60M bytes of disk storage, a magnetic tape drive, operating system software and a Cobol compiler.

Stratus, 17 Strathmore Road, Natick, Mass. 01760. ACI, 206 50th Ave., Omaha, Neb. 68154.

REMOTE COMPUTING CORP.

Scheduled Amortizations System

Remote Computing Corp. has announced the Scheduled Amortizations System, which was designed for use with the IBM Series/1 minicomputer and the multiuser Datamedia Corp. Model 932 microcomputer.

A spokeswoman said software will be sold as a turnkey system with an IBM or Datamedia processor and will utilize Pick & Associates, Inc.'s Pick operating system. The Scheduled Amortizations System features book basis and tax basis calculations, standard depreciations and appreciation

Continued on page 76

HIGH PERFORMANCE HANDLING

File-AID Puts You In the Driver's Seat to Access Data without Programming.

File-AID gives you high performance handling benefits.

- ☐ Immediate Data Access Without Programming
- ☐ Improved Testing Effectiveness
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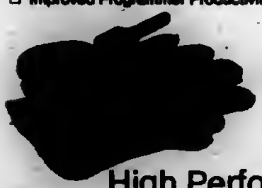

File-AID the Key to High Performance.

File-AID speeds up the utility functions associated with record and file handling.

File-AID is a dependable and reliable tool. And it is supported by a crew of professionals at Compuware, a company with over 2,000 users worldwide.

File-AID is flexible and able to respond in all situations: test and production; regular and special functions.

File-AID is efficient. It combines many utilities into one inexpensive, easy-to-use productivity tool.

File-AID gives the professional greater control over his data environment.

File-AID can put you in the driver's seat fast. It is easy to use and requires virtually no training. The menus, panels, tutorials and control information make it a natural extension of your current environment.

File-AID/SPF

All Access Methods.

File-AID/SPF supports BROWSE, EDIT & UTILITY functions for all standard IBM access methods.

Record/Member Selection.

File-AID/SPF provides expanded IF, AND, and OR logic for record or member selection and processing.

Logical JCL Processing.

File-AID/SPF recognizes JCL as a special format and JCL is treated as logical statements.

Improved Edit.

File-AID/SPF provides a record editor for all access methods with no record or file length restrictions.

New SPF Utility Functions.

File-AID/SPF provides many new utility functions including:

- ☐ Load module CSECT and directory entry mapping
- ☐ Selective COPY functions for records/members.
- ☐ New full function VTOC utility.
- ☐ Full VSAM cluster, alternate index and path support (display, delete, etc.) without the IDCAMS utility.

Ease of Use.

File-AID/SPF requires no training.

File-AID/BATCH

All Access Methods.

File-AID supports all standard IBM OS or VS access methods and device types.

Multi-Function Utility.

File-AID/BATCH is a parameter-driven utility which combines the most often used file and record handling functions.

- ☐ Print, list or dump whole records or portions of records.
- ☐ Copy up to 99 datasets without control cards while mixing any file organization or record format.

File-AID is a comprehensive, easy-to-use data manipulation utility.

- ☐ Selective retrieval or sampling from any file based on record position, or data contents to the bit level.
- ☐ Altering data format or record structure.
- ☐ Access multiple datasets.
- ☐ Accumulate data in any format.

Additional Information.

File-AID/BATCH provides complete audit trail information as well as concise control card error messages.

Flexibility.

The flexibility of File-AID/BATCH is demonstrated by its ability to combine data from different sources or to copy data from or to unlike devices or access methods or record formats.

Test Drive File-AID with a FREE PRODUCT EVALUATION TIME TRIAL.

Get behind the wheel. Try File-AID's High Performance Handling with your own drivers and crew. For your FREE 30-day evaluation call 800-521-9353 (in Michigan or Canada: 313-540-0400).

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SYSTEMS & PERIPHERALS

Continued from page 74

tions, including straight line, sum of the month's digits and double-declining balance.

The system also offers standard as well as custom management reports. Standard reports include detail and summary trial balances, detail and summary reports by location, sales and retirements and current depreciation. It is integrated with Remote Computing Corp.'s General Ledger System for the IBM Series/1 minicomputer and the Datamedia 932.

The Scheduled Amortizations System for the IBM Series/1, including standard hardware configuration, is priced at $100,000. The system for the Datamedia 932 is priced at $50,000.

Remote Computing, 1078 E. Meadow Circle, Palo Alto, Calif. 94303.

EASTMAN KODAK CO.
Release 1.2 of KAR-4000

Eastman Kodak Co. has introduced Release 1.2 of KAR-4000, a software package for its KAR-4000 information system.

According to the vendor, the KAR-4000 is a system that stores document images on microfilm and corresponding computer data on magnetic media. Enhancements include multivalue data entry, batch data entry, check digit routines and international date capability.

The system includes a Mentor Graphics Corp. CPU, disk storage of varying size, CRT terminals, a printer and operating system and application software, the company said.

The software is free to system customers. The price for the KAR-4000 system starts at about $70,000.

Eastman Kodak, 343 State St., Rochester, N.Y. 14650.

PROCESSORS

COMPUTER AUTOMATION, INC.
Syfaplus

Computer Automation, Inc. last week unveiled a slightly smaller version of its Syfa 16-bit minicomputer for distributed processing applications.

Called the Syfaplus, the unit can either function as a stand-alone minicomputer or be integrated into the firm's Syfanet local-area network. The Syfaplus system reportedly offers roughly the same performance as the firm's upper-end Syfa 1000 processor plus the cache memory capability of the firm's top-of-the-line Syfa 2000 processor. The company refused to comment on whether the Syfa 1000 or 2000 is still being offered.

The CPU, which occupies a 2-ft cube, comes with 256K bytes of random-access memory, a 32M-byte Winchester disk drive (expandable up to 100M bytes) and a 10M-byte streaming cartridge tape drive for backup. The system has between eight and 24 I/O ports and can accommodate up to 24 terminals. The system can communicate with IBM mainframe processors via IBM's Systems Network Architecture, the vendor said.

Like the earlier Syfa systems, Syfaplus uses Computer Automation's Sybol programming language and the firm's Syclops operating system.

Syfaplus costs between $19,000 and $20,000.

Computer Automation, 1800 Jay Ell Drive, Richardson, Texas 75081.

JOHN FLUKE MANUFACTURING CO., INC.
2400B

John Fluke Manufacturing Co., Inc. has announced the 2400B, an intelligent front-end processor for data acquisition and control and product testing applications.

The 2400B is said to interface with any mainframe, microcomputer or instrument computer at distances up to 4,000 ft. The unit can also be accessed from remote locations through modems and telephone lines.

A 16-bit, on-board CPU provides the system's stand-alone capability through a stored application program of up to 28K bytes of random-access memory, which may be downloaded from the host or stored permanently in erasable programmable read-only memory. That intelligence enables the 2400B to monitor numerous analog and digital inputs, such as voltage, ohms, thermocouples, real-time device strain, frequency, time intervals, totalizing, binary coded decimal and binary and contact closure.

Depending on the specific user application, the vendor said, options are available for up to 1,000 analog inputs, 1,024 digital I/Os and 128 analog outputs. The 2400B is user programmable and features a resident, high-level, English-like language.

The 2400B costs $4,390. System prices range from $5,400 to $100,000, according to user applications and requirements.

John Fluke Manufacturing, P.O. Box C9090, Everett, Wash. 98206.

DATA STORAGE

DYLON DATA CORP.
Model 1066A magnetic tape controller

Dylon Data Corp. has introduced its Model 1066A magnetic tape controller for use with Hewlett-Packard Co. HP 1000, HP 3000 and HP 9000 series processors.

The 1066A is hardware- and software-compatible with the HP 7970E drive and requires no change to the driver software, the company said.

The tape controller features 45 in./sec and 75 in./sec operation, the vendor said.

It is priced at $4,995.

Dylon Data, 9561 Ridgehaven Court, San Diego, Calif. 92123.

SYSTEMS & PERIPHERALS

EMC CORP.
Prator-300

The Prator-300, a 300M-byte sealed media disk subsystem for Prime Computer, Inc. processors has been introduced by EMC Corp.

Based on a 315M-byte unformatted Winchester-type drive, the Prator-300 is a rack-mountable unit, EMC said. A single module can be housed in a communications cabinet or under a tape drive. Up to three modules can be mounted in an EMC-supplied cabinet, providing up to 900M bytes of formatted storage.

A single Prator-300 module is priced at $10,500 and includes formatting of the drive, according to user specifications, a Prime controller upgrade kit, cabling, mounting rails and installation.

When housed in an EMC-supplied stand-alone cabinet, a single module is $11,200 installed. Two modules, providing 600M bytes, are priced at $21,000 including cabinet; three modules, or 900M bytes, are $30,500.

EMC, 12 Mercer Road, Natick, Mass. 01760.

PRINTERS/PLOTTERS

SYNERGY PRINTER SYSTEMS, INC.
LW400, LW800

Synergy Printer Systems, Inc. has introduced the LW400 and LW800 line printers.

According to the vendor, the printers produce near-letter-quality printing at speeds of 400 and 800 lines per minute. They utilize an 80-yard cassette ribbon, an intelligent control panel and a four-character, alphanumeric display.

The price of the LW400 with a Dataproducts, Inc.- or a Centronics Data Computer Corp.-compatible parallel interface, acoustic cabinet and paper basket is $5,950. The price of the LW800 with the same features is $7,950. The optional RS-232 serial interface is $495.

Synergy Printer Systems, 4080 Fabian Way, Palo Alto, Calif. 94303.

GROUP THREE ELECTRONICS, INC.
Guardian Data HP1503, HP3003, HP3005

Group Three Electronics, Inc. has announced three line printers compatible with Hewlett-Packard Co.'s HP 3000 line of superminicomputers.

The Guardian Data HP1503 reportedly features a 96-char. Ascii set for DP printing at 150 lines/min and correspondence printing at 80 lines/min. It also has a 64-char. Ascii set for condensed printing at 200 lines/min. in uppercase letters only.

Standard features are said to include a forms-length selector switch, double-high characters, underlining and full-dot addressable graphics. Options include additional character fonts and bar-code and label-generation hardware, a spokesman said.

The printers require an RS-232 interface to the HP 3000, but do not require any software changes to the system, the spokesman said.

The HP1503 costs $4,740.

Two other models offer similar features to the HP1503, but have faster printing speeds. The HP3003, priced at $6,295, has a print speed of 300 line/min. The HP3005, priced at $8,295, prints at 500 line/min., the spokesman said.

Group Three Electronics, 9513 Manhattan Beach Blvd., Redondo Beach, Calif. 90278.

GRAPHICS SYSTEMS

NEW MEDIA GRAPHICS CORP.
Graphover 9500

New Media Graphics Corp. has introduced a color graphics generator called the Graphover 9500.

The Graphover 9500 is a color graphics generator that combines graphics coming from a computer with video coming from any videodisk, videotape or TV camera.

The Graphover 9500 offers features such as encoders, decoders, video and audio switchers, videodisk interfaces, graphics tablets, light pens and touch-screen controls.

Applications for the Graphover 9500 include interactive training, simulation, presentation graphics, point-of-sale and process control.

Available under the Government Services Administration, the list price of the Graphover 9500 is $9,950. Quantity discounts are available.

New Media Graphics Corp., 379 Cambridge St., Burlington, Mass. 01803.

POWER SUPPLIES

DATAPOWER, INC.
DP-7000 series

Datapower, Inc. has introduced a line of 750W switching-power supplies that are available in seven voltage-current output combinations ranging from 2V and 150A to 28V and 26A.

The DP-7000 series of power supplies delivers more than 2.5W of output power per cubic in., the vendor said. Seven voltage-current output models are available: 2V/150A, 5V/150A, 12V/62A, 15V/50A, 18V/41A, 24V/31A and 28V/26A.

The models are priced at approximately $650 each, according to the vendor.

Datapower, 3233 W. First St., Santa Ana, Calif. 92703.

See POWER page 78

SYSTEMS & PERIPHERALS

POWER from page 77

ELECTRONIC SPECIALISTS, INC.
KLR portable line conditioners

Electronic Specialists, Inc. has announced its KLR series of portable line conditioners designed to protect sensitive computer equipment.

Available for 250W, 500W, 1,000W and 2,000W loads, the KLR line conditioners deliver 120V at 3% regulation for 90V to 140V input variations. Other features of the KLR series include input spike suppression, transformer surge suppression, wide-band prefiltering and isolated winding line noise elimination.

The 250W unit is priced at $292, the 500W unit at $391, the 1,000W model at $562 and the 2,000W model at $977.

Electronic Specialists, 171 S. Main St., P.O. Box 389, Natick, Mass. 01760.

BOARD-LEVEL DEVICES

EMC CORP.
E8-II

EMC Corp. has announced a 2M-byte, add-in memory card for the Prime Computer, Inc. Series 50 computer systems.

The E8-II was designed for use in any Prime system up to and including the P650. Using a 64K-byte, random-access memory component, the E8-II is hardware- and software-compatible with Prime memory cards and host processors, EMC said.

Other features of the memory card include on-board error check and correc-

Continued on page 80

FBA from page 73

IBM to breathe life back into FBA. The reason, Moore stated, is FBA is a much neater way of storing data.

CKD, FBA differences

CKD devices, explained Jeffrey Buzen, an analyst with the Lincoln, Mass., processor performance consulting firm of BGS Systems, Inc., allow users the option of placing most active files where they can be quickly accessed. But they also require users to pay a penalty in overhead.

Buzen explained that pointers and other housekeeping items that keep track of where data is stored on a CKD disk drive can become cumbersome. The problem is not so much the pointers themselves, Buzen said, as it is the tiny gaps that CKD devices require between fields.

The gaps must be uniform in length; as the storage density is increased, the storage capacity lost by those tiny gaps also increases — almost to the point where the gaps take up more space than the actual data.

FBA, on the other hand, automatically stores data for users according to logic built into FBA devices and Vsam.

Noting that one of the problems with FBA has been the reluctance of CKD users to convert, Buzen said IBM could create a hybrid disk drive that employs both technologies.

With the flood of microprocessors on the market today, Buzen said IBM could easily develop specialized microprocessors to convert CKD data to an FBA format.

The result would be a high-capacity disk drive that, to the user, appears to be a CKD device. But under the surface, the unit would have all the trappings of an FBA drive.

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CW21

SYSTEMS & PERIPHERALS

Continued from page 78

tion and support for interleaving and wide word memory modes.

According to EMC, the E8-II provides 2M bytes in a single slot, enabling the user of single chassis machines to expand memory up to 8M bytes.

The E8-II is available at a price of $12,000.

EMC, 13 Mercer Road, Natick, Mass. 01760.

APPLIED MICRO TECHNOLOGY, INC.
ST4506

Applied Micro Technology, Inc. (AMT) has introduced a standard graphics controller said to generate a display of 640 by 480 pixels.

The ST4506 is a 64K-byte memory board featuring user-selectable wire-wrap options, programmer-definable intensity, direction and size and a memory-mapping design.

Multiple ST4506 boards reportedly can be chained together to generate gray-scale or color outputs.

A Digital Research, Inc. CP/M-compatible software support package is provided on an 8-in. diskette.

The software reportedly emulates a standard plotting device by supporting plot, draw, label, character drawing and associated functions.

The ST4506 is shipped with software, source code, example Basic programs and technical manual and costs $480 in quantities of 50.

AMT, P.O. Box 3042, Tucson, Ariz. 85702.

FLESSEY PERIPHERAL SYSTEMS, INC.
Memory expansion

Flessey Peripheral Systems, Inc. has reconfigured the standard memory capacity for its Series 6200 32-bit computer system based on Digital Equipment Corp.'s LSI-11/23 board-level minicomputer.

The expansion features range from two 256K-byte memory boards to one dual-wide 512K-byte board. The expansion can free up one additional card slot for additional communications devices or peripheral controllers for the Models 6244 and 6245.

Memory capacities of Models 6247 and 6248 have increased to 1M byte from 768K bytes. The memory redefinition of the models provides an additional card slot in the bus.

Prices for the Model 6244 and 6245 remain the same at $10,485 and $12,650, respectively. Models 6247 and 6248 are increased to $11,885 and $14,050, respectively.

Flessey Peripheral Systems, 17466 Daimler, Irvine, Calif. 92714.

AUXILIARY EQUIPMENT

ADALOGIC
Gateway

Adalogic has announced a stand-alone computer password security device that reportedly can be used with asynchronous modems on dial-up or leased lines connecting to microcomputers, minicomputers or mainframes.

Called Gateway, the device requires entry of both a correct identification code and password before entry is permitted, a vendor spokesman said. If the correct codes are not entered in three attempts, the security device forces the modem to disconnect.

The user also can define a time limit for a successful logon attempt, after which time the device breaks the connection, the spokesman said.

Gateway provides up to 20 passwords and user identification codes.

The device connects between the modem and host computer to any RS-232 full-duplex port and reportedly operates at 300 or 1,200 bit/sec on dial-up lines and 300, 1,200 or 9,600 bit/sec on leased lines.

It is available for $395, the vendor said.

Adalogic, 1522 Wisteria Lane, Los Altos, Calif. 94022.

COMPUTER SECURITY INSTITUTE
Free security booklet

The Computer Security Institute is offering a free guide booklet on the topic of computer security.

The 12-page booklet, titled "Computer Security — A Manager's Guide (Pure and Simple)," was designed to provide company managers with basic background on the need for computer security, the vendor said.

The booklet can be ordered by sending a self-addressed, business-size envelope with 37 cents postage to Computer Security Institute, the vendor said.

Computer Security Institute, Department B-14, 43 Boston Post Road, Northborough, Mass. 01532.

INTEL CORP.
Speech transaction products

Intel Corp. has increased the power and added more natural responses to its line of speech recognition products.

The family of speech transaction systems includes the Speech Transaction Development System (ISBC 570 and Intellec Development System), the ISBC 576 Speech Transaction Board and the ISBC 577 chip set. The Model 576 can remember and adapt to changes in the operator's vocal pattern, the vendor said.

A number of application-independent functions have been added, including utterance, field, transaction, prompt and Help functions to support speech synthesis. The enhanced products can be integrated into other systems and complement other I/O devices, according to the vendor.

All are compatible with Intel open systems standards, as well as Intel's IRMX and Microsoft, Inc.'s Xenix-based System 300 family of microcomputers.

Prices are $4,900 for a single ISBC 570 development set, $2,900 for the ISBC 576 board and $600 for a minimum order of 500 units for the ISBC speech chip set, the vendor said.

Intel, 3065 Bowers Ave., Santa Clara, Calif. 95051.

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OPERATING SYSTEM	MS DOS Version 1.25 or 2.0 with G.W. BASIC
MICRO-PROCESSOR	High-speed 16-bit 8088
DISPLAY SCREENS	High Definition monochrome display. High resolution color display. IBM compatible graphics.
COMMUNICATIONS	Built-in Asynchronous
KEYBOARD	84 keys, 6 ft. cord
AUXILIARY MEMORY	Up to two internal 5¼" diskettes. 10MB internal fixed disk when configured with single diskettes.
USER MEMORY	Standard 128K bytes, expandable to 640K
DIAGNOSTICS	Power-on self test.
CLOCK	Time-of-day with battery back-up

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Prepared by LEWIS, GRAHAM & KYNETT, INC., Philadelphia.

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MICROCOMPUTERS

Portable micro, cluster device out from IBM

By Tom Henkel
CW Staff

BOCA RATON, Fla. — IBM has added a portable version of its Personal Computer to its growing line of microcomputer offerings. At the same time, IBM announced a feature that reportedly allows up to 64 Personal Computer, Personal Computer XT or entry-level PCjr micros to be connected in a cluster.

Available March 1, the Portable Personal Computer will apparently only be offered in very limited quantities. Industry watchers speculated that IBM will give delivery preference to big national accounts over the firm's 1,400 retail outlets.

The unit weighs approximately 30 lb and uses the same Intel Corp. 16-bit 8088 microprocessor used in the desktop Personal Computer, Personal Computer XT and the PCjr.

The unit also supports IBM's PC-DOS Release 2.1 and Microsoft, Inc.'s MS-DOS operating systems. It comes in a 20-in. by 17-in. by 8-in. carrying case and features 256K bytes of random-access memory, expandable to 512K bytes. A standard 9-in. amber monitor is included, which can display graphics and up to 25 80-char. lines of text, according to a spokesman for IBM.

The Portable Personal Computer offers a 360K-byte half-height disk drive and adapter. A second half-height disk drive can be added to expand the total disk storage to 720K bytes, IBM said.

A Portable Personal Computer with 256K bytes of user memory, a 360K-byte half-height disk drive, display keyboard, carrying case and IBM's PC-DOS Release 2.1 operating system costs $2,795. A second half-height 360K-byte disk drive costs $425, IBM said.

Personal Computer Cluster Program

In addition, IBM announced the Personal Computer Cluster Program, a $92 program that allows users to connect as many as 64 processors. With the program, messages and information can be exchanged and shared between workstations. However, the workstations must be connected via a cable, IBM said. In addition, the Cluster Program allows workstations to share information on a fixed disk drive at one machine in the cluster, according to the IBM spokesman.

Since the Cluster Program license is required for each processor in a cluster, IBM is offering, in addition to the Cluster Program, the Five-Pack, which includes one diskette copy of the program, five licenses and five sets of publications to support the program.

The Five-Pack costs $400, IBM said. To support the interconnection of different IBM Personal Computers, IBM announced a series of options.

The IBM Personal Computer Cluster Adapter is required for each IBM Personal Computer, Personal Computer XT or Portable Personal Computer in the cluster. The Adapter costs $340 and fits into one of the full-size expansion slots in the microcomputer's backplain, according to the spokesman.

For attachment of a PCjr to a cluster, a special adapter, which attaches to the side of an entry-level PCjr, was also announced.

Currently, the entry-level model is the only one which can be connected in a cluster. The adapter costs $400, the IBM spokesman said.

IBM is also offering a Cluster Cable Kit, which provides the cables and connectors to connect two Personal Computers to

See IBM page 84

INSIDE

S1 gets kudos, but needs major endorsement

By Paul Gillin
CW Staff

The S1 operating system announced recently by Multi Solutions, Inc. [CW, Feb. 13] appears to incorporate nearly every major capability demanded by microcomputer software developers and then some. But while observers agree that S1 has impressive features, they point out that the software has yet to capture an endorsement from a major hardware vendor. That could be the most difficult hurdle to clear, they say.

Among the facilities developers claim for S1 is portability across most microprocessors, from 8-bit to 32-bit. The system supports up to 256 parallel processors, can read and write files to and from virtually all of the major micro operating systems, as well as Digital Equipment Corp.'s DEC Files 11, and it is fully machine-independent. A command processor allows commands to be abbreviated or changed so that the operating system can emulate virtually every other micro operating system, according to Charles J. Lombardo, chairman of Multi Solutions, based in Lawrenceville, N.J.

In fact, developers claim there is almost no capability that can't be added to S1. The reason is the system's modularity. Written in a high-level language called SL, the operating system can be ported to other hardware with three months or less of reprogramming, Lombardo said.

SL was developed by Robert R. Knight, a former Princeton University professor who has designed more than 60 compilers. Similar in structure to Pascal or C, SL performs "almost at machine-code level," making it fast and easy to compile, Lombardo said.

One observer who has seen the operating system in action concurred. "SL appears to be more flexible than C," said Mark Tebbe, a technical consultant at Arthur Andersen & Co. in Chicago. "It's also very easy to follow and maintain. If I had an SL compiler, I'd write in that before I'd write in C."

SL consists of only 12 statements and an automatic load linker to generate an operating system ranging from 2K bytes to 120K bytes in the full implementation. Because the operating system is modular, the designer can incorporate only those features that are needed, Lombardo said. Modules can be added to the operating system at any time, using the linker to create the links at runtime.

Some of the features developers claim can be added include multitasking, win

See S1 page 92

Multiuser DbaseII introduced for IBM micros now, Apples later

CULVER CITY, Calif. — Ashton-Tate has announced a multiuser version of its Dbase II data base management system for microcomputers.

A four-user data base manager running under Musys Corp.'s Turbodos operating system and able to manage 65,000 records, the multiuser software package operates over 3Com Corp.'s Etherseries local-area network, which is based on Xerox Corp.'s Ethernet.

Ashton-Tate President David C. Cole said that as "more and more local-area networks come on-line and get a reasonable following, we will adapt the product to them."

Ashton-Tate said support of Corvus Systems, Inc.'s Omninet, Novell Data Systems, Inc. Netware and Orchid Technology, Inc.'s PCnet networks is "soon to come."

A feature of the new product allows many users to share information, but only allows one user at a time to make changes. Price of a four-user data base manager was given at $1,000, with four-user update kits to permit later groups to join the data base network listed at $600. The product will be available on May 4.

Initially the software will run only on IBM Personal Computers, Cole said. In the fourth quarter, the product will be available for Apple Computer, Inc.'s Lisa II. Availability on Apple's Macintosh is also planned.

Ashton-Tate is headquartered at 10150 W. Jefferson Blvd., Culver City, Calif. 90230.

Appleline, cluster controller said to link Apples to IBM nets

CUPERTINO, Calif. — Apple Computer, Inc. has announced a coaxial attachment unit that allows Apple microcomputers to connect to an IBM or IBM-compatible network.

Called Appleline, the unit enables Apple micros to use existing coaxial cable installations and IBM 3270 cluster controllers servicing a mainframe computer network. Appleline reportedly can be used with the Apple Macintosh, Lisa and Apple III to provide IBM 3278 terminal emulation.

In a related announcement, Apple unveiled the Apple Cluster Controller, an alternate method for communications with IBM and IBM-compatible networks for organizations that have not installed IBM 3270 cluster controllers and 3278 terminals.

To utilize Appleline, Lisa users are required to use Apple's Lisaterminal data communications software; Macintosh users are required to utilize Apple's Macterminal communications software; and Apple III users are required to utilize Apple's Access 3270 software.

Appleline is priced at $1,295. The Apple Cluster Controller costs $4,500 for a three-port version and $7,000 for a seven-port version. The Access 3270 and Lisaterminal packages are priced at $150 and $295, respectively. Macterminal, priced at $00, will be available the first quarter of 1984.

Apple Computer is located at 20525 Mariani Ave., Cupertino, Calif. 95014.

MICROCOMPUTERS

SYSTEMS

AKA COMPUTERS, INC.
AKA PC; AKA Plus

AKA Computers, Inc. introduced two microcomputers compatible with IBM's Personal Computer XT.

The microcomputers feature an Intel Corp. 8088 microprocessor, 128K bytes of random-access memory (RAM), five expansion slots, two serial ports and a parallel port. The microcomputers can be expanded with four floppy disk drives and 256K bytes of RAM.

AKA PC costs $3,295. AKA Plus, with 10M bytes of hard disk storage, sells for $4,795.

AKA Computers, P.O Box 36247, Charlotte, N.C. 28236.

KAYPRO CORP.
Kaypro 4 enhancements

Kaypro Corp. has announced an enhanced version of its Kaypro 4 microcomputer that incorporates a built-in modem, improved display facilities, graphics and improved screen features.

The Kaypro 4's built-in 300 bit/sec modem automatically adapts the micro for communications and electronic mail applications and offers access to data bases, a spokesman said.

Screen features include a clearer display, highlighting, dual-intensity display segments and blinking cursor.

Improved graphics are made available through a monitor with a resolution of 100 pixels by 160 pixels, the spokesman said. For word processing, the Kaypro 4 incorporates a new 80-col. by 25-line display.

The enhanced version sells for $1,995, according to a spokesman for the vendor.

Kaypro, 533 Stevens Ave., Solana Beach, Calif. 92075.

STORAGE

DAVONG SYSTEMS, INC.
Mac Disk

Davong Systems, Inc. has announced a family of hard disk drives for Apple Computer, Inc.'s Macintosh microcomputer.

Called Mac Disk, the unit is available in six memory configurations: 5M, 10M, 15M, 21M, 32M and 40M bytes. The units will be shipped with all necessary cabling and adapters, software utilities and documentation. Prices range from $1,995 to $4,995, a spokesman said.

Davong Systems, 217 Humboldt Court, Sunnyvale, Calif. 94089.

AVCOM, INC.
Safe-Gard

Avcom, Inc. has introduced Safe-Gard, a disk security system for the IBM Personal Computer, Personal Computer XT and compatible systems.

Using a custom-layered encryption algorithm, Safe-Gard diskettes are said to prevent programs from bit copying and also allow users to write-protect disks to avoid accidental erasure. Backup copies can be made but will work only on Safe-Gard disk, according to a vendor spokesman.

Two Safe-Gard diskettes cost $9.95 with quantity discounts available.

Avcom, P.O. Box 29153, Columbus, Ohio 43229.

IBM from page 83

form a cluster. The Kit costs $110. Three or more microcomputers can be connected by using multiple Cluster Cable Kits, IBM said.

IBM announced the Portable Personal Computer and Cluster Program through its Entry Systems Division, located at P.O. Box 2989, Delray Beach, Fla. 33444.

IBM offer comes as no surprise

BOSTON — For at least one industry watcher, IBM's announcement of a Portable Personal Computer and Computer Cluster Program did not come as a surprise.

Chris Christiansen, an analyst with The Yankee Group market research firm based here, noted that IBM has been expected to announce a portable version of the Personal Computer for some time.

Christiansen noted that the Portable Personal Computer, other than putting the IBM seal of approval on portable computers, does not offer anything that compatible portables offered by Compaq Computer Corp. and other vendors do not.

The next step, he said, both for IBM and the other portable manufacturers, is to develop a lap model of the Personal Computer.

Noting that the Portable Personal Computer is expected to be available in extremely limited quantities, Christiansen noted its introduction will probably have little short-term impact on non-IBM vendors of portables. Most portable vendors will, however, be forced to lower their prices, Christiansen noted.

Contending that IBM has been rumored to be readying a local-area network for its microcomputer lineup, Christiansen called IBM's Computer Cluster Program a stopgap measure until IBM can offer a local-area net.

Like the Portable Computer announcement, Christiansen said, the cluster technique is not a new technology.

Software Digest
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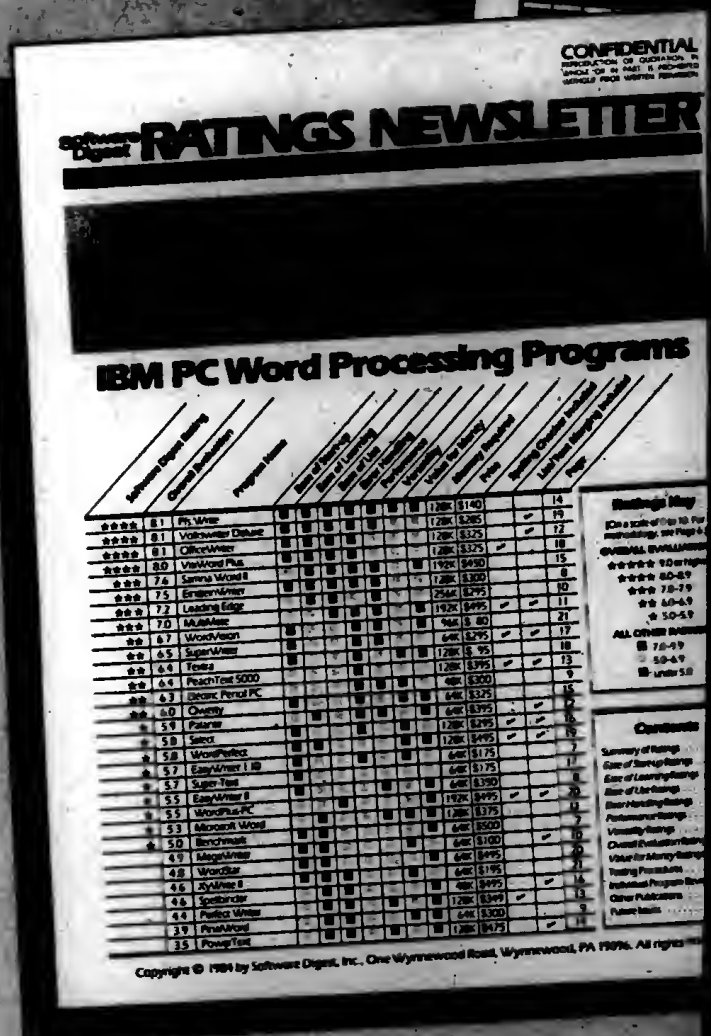

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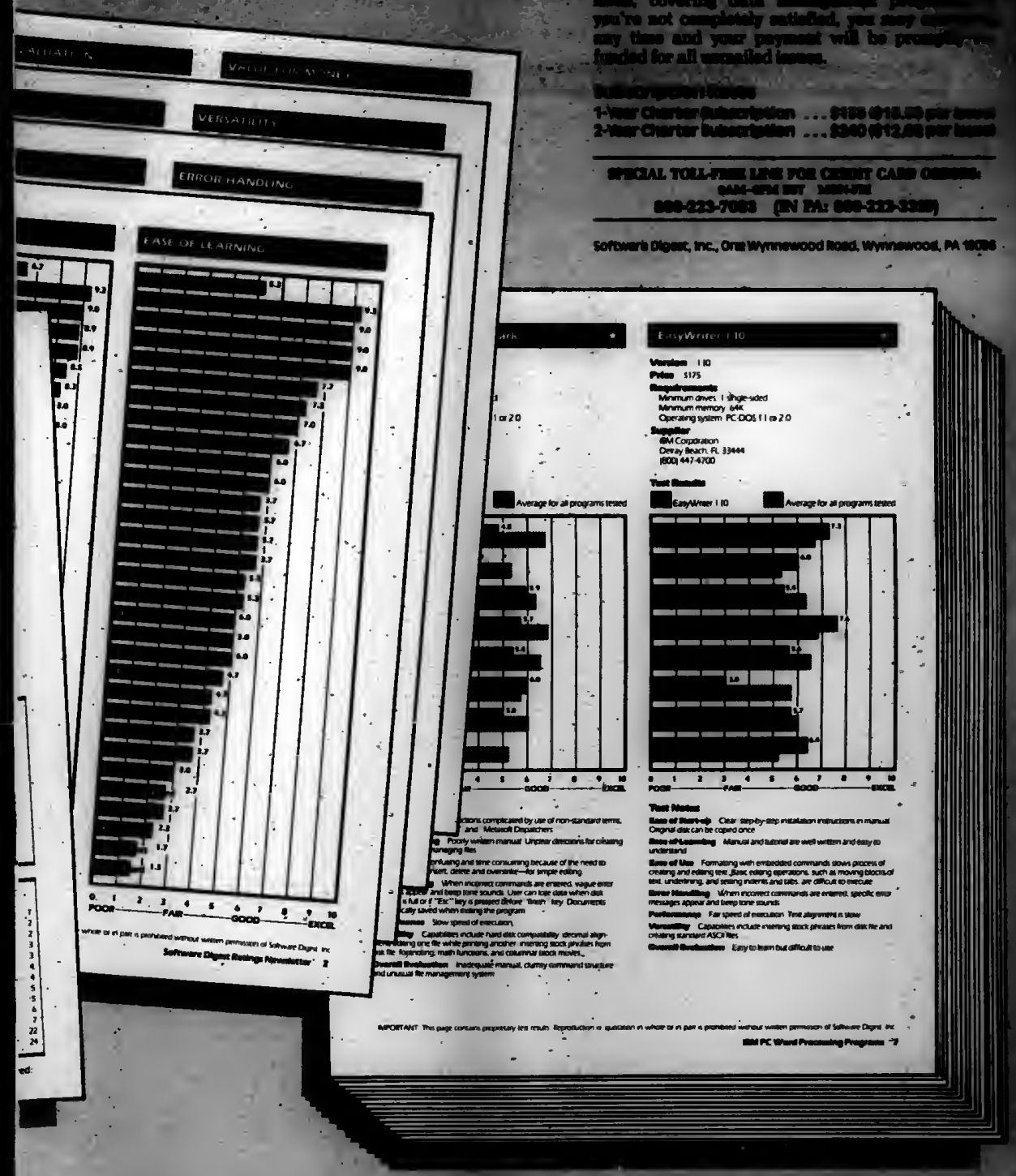


Want to know how Software Digest ratings are determined? Please turn the page ►

Here's how Software Digest tested and rated 30 IBM PC word [illegible] took two months and cost over $100,000. The testing of data [illegible] completed with a different series of tests designed just for that [illegible] software will be tested with the same methodical thoroughness, [illegible]

Reproduced from the first issue of the Software Digest RATINGS NEWSLETTER.

THE SOFTWARE DIGEST RATINGS METHODOLOGY

Testing and Rating Procedures for Word Processing Programs

Testing Procedures

Our testing procedures for word processing programs consisted of three phases:

In the first phase (INSTALLATION), the reviewers installed the program following the instructions given by the software supplier. This generally included making one or more backup copies of the master disk, adding the operating system to the program disk, creating a data disk, and selecting the correct type of monitor (color or monochrome) and printer. The installation procedure was timed and comments noted.

During the second phase (THE "2-HOUR TEST"), reviewers were given exactly two hours to learn how to edit a simple letter with the program, plus whatever else could be learned within that period. This was the only phase with a specific time limit. A two-hour limit was chosen because it is about the maximum time a typical user would spend with a program before trying to use it.

In the final phase (EDITING/PRINTING), reviewers were given a prepared disk file containing a standard one-page letter with text to be changed, deleted, moved, copied, centered, underlined, and then printed. As with the installation procedure, editing and printing were timed. Thus, the test was designed to answer the question: "After spending two hours to learn this word processing program, how difficult and time consuming is it to produce a typical business letter?"

At the end of each phase, reviewers reported their observations on a detailed report form. Individual scores were recorded for the ease of performing a typical range of editing functions, as well as ease of installation, ease of learning, ease of use, speed of execution, error messages, error resistance, and overall evaluation.

Rating Procedures

Information provided by the tests was statistically summarized in eight rating categories described below. Each category had a possible score between 0 and 10 (10 being the highest rating).

Ease of Start-up Ease of getting the program "up and running." It included the average time required for installation (inverted and adjusted for upper and lower limits) and the average Ease of Installation score.

Ease of Start-up = ((10 − ((Installation Time − 5) / 45 • 10)) + Ease of Installation) / 2

Ease of Learning The average Ease of Learning score. It was a measure of how simple it was to learn to use the program, as determined by each reviewer.

Ease of Learning = Total Ease of Learning Scores / 10

Ease of Use Statistical mean of the average time required to edit and print the standard letter (inverted and adjusted for upper and lower limits), the average Ease of Use score, and the average Functional score (composed of a series of editing procedure scores).

Ease of Use = ((10 − ((Minutes to Edit − 15) / 105 • 10)) + Functional Score + Ease of Use) / 3

Error Handling A weighted composite of reviewer scores (50%) and our Technical Department's error-testing procedures (50%). Reviewer scores included whether the program "froze" (i.e., refused to respond to further user commands), whether data was lost, and the average scores for Error Messages and Error Resistance. The Technical Department procedures included tests for how the program handled specific situations: disk full, disk directory full, attempting to read a disk with the drive door open, reading and writing to a non-existent drive (e.g., Q:), writing to a write-protected disk, system memory full, printer cable disconnected, and printer turned off. Each program was also checked to see if it prompted users when they attempted to leave the system before saving the current text to disk.

Error Handling = (Freeze + Data Lost + Error Messages + Error Resistance + (4 • Lab Score)) / 8

Performance Statistical mean of the average Execution Speed score and the average letter score (i.e., how well the reviewers were able to correctly edit and print the final copy of the letter).

Performance = (Execution Speed + Letter Score) / 2

Versatility The program's power, above and beyond simple word processing functions, based on a checklist of 20 advanced features. One point was given for each of the 20 features on the following list which the program possessed, and the total was divided by two to place it on a 10-point scale.

Versatility = (Five or more printers specifically supported +
Hard disk compatibility +
User can reassign keys or build macro commands +
Shows preview of printing +
Decimal alignment +
Can edit one file while printing another +
Can insert stock phrases from disk file +
Deletions can be restored +
Creates standard ASCII files +
Split screens or windows +
Multicolumn formatting +
Virtual memory +
Footnoting capability +
Mouse compatible +
Math capability +
Index and/or table of contents creation +
Columnar block moves +
Soft hyphenation +
Text can be more than 80 columns wide +
Print selected page or range of pages) / 2

Overall Evaluation A weighted average of all of the preceding ratings and the average Overall Evaluation score, as follows:

Overall Evaluation = ((2 • Ease of Use) + Ease of Start-up + (2 • Ease of Learning) + Performance + (2 • Error Handling) + Versatility + (2 • Overall Evaluation)) / 11

Value for Money An indication of what to expect for your money. The two variables were the Overall Evaluation rating and the program price. For the purpose of fair comparison, the retail price of each program was adjusted by subtracting $50 for each major accessory program included (such as list/text merge and spelling checker programs). These accessory programs were not tested and, therefore, played no part in the reviewer scores.

Value for Money = (Overall Evaluation + (10 − (Adjusted Price − 50) / 45)) / 2

MICROCOMPUTERS

BOARD-LEVEL DEVICES

EDUCATIONAL MICROCOMPUTER SYSTEMS
M68K development package

Educational Microcomputer Systems has introduced its M68K hardware/software package, which allows the development and debugging of Motorola, Inc. 68000 programs on the IBM Personal Computer, Apple Computer, Inc. Apple II and Radio Shack TRS-80.

According to the vendor, the hardware is a standalone 68000 single-board computer with a 6-MHz or 10-MHz 68000 CPU, 20K bytes of static random-access memory, 16K bytes of erasable programmable read-only memory, two RS-232 serial ports, a 16-bit parallel port, five 16-bit counter timers and an expansion bus to allow for memory and I/O expansion.

The package starts at $795 for a 6-MHz version.

Educational Microcomputer Systems, P.O. Box 16115, Irvine, Calif. 92713.

PATHWAY DESIGN, INC.
Pathway Design/3770; Communications Adapter; Adapter Cable

Pathway Design, Inc. has introduced Pathway Design/3770, which transfers files to and from IBM hosts in Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) or Binary Synchronous Communications (BSC) networking environments by emulating 3770 remote job entry stations.

The product works with the IBM Personal Computer and the Wang Laboratories, Inc. Professional and can be enhanced to support the Digital Equipment Corp. Rainbow and Unix-based systems.

Pathway Design/3770 allows the microcomputers to send and receive data simultaneously by emulating a multilogical unit that supports six data streams.

The product supports host data compression, full-formatted printing, multiple-selectable devices and Ascii or Ebcdic line transmission, the vendor said.

The vendor also announced its Pathway Design/Communications Adapter, a multifunction, dual-channel circuit card that operates in conjunction with the vendor's software and the Pathway Design/Adapter Cable.

The Pathway Design SNA/SDLC and BSC products are priced at $595.

The Communications Adapter is $295, and the Adapter Cable is $50.

Pathway Design, 177 Worcester St., Wellesley, Mass. 02181.

AUXILIARY EQUIPMENT

PMC INDUSTRIES, INC.
Model 033

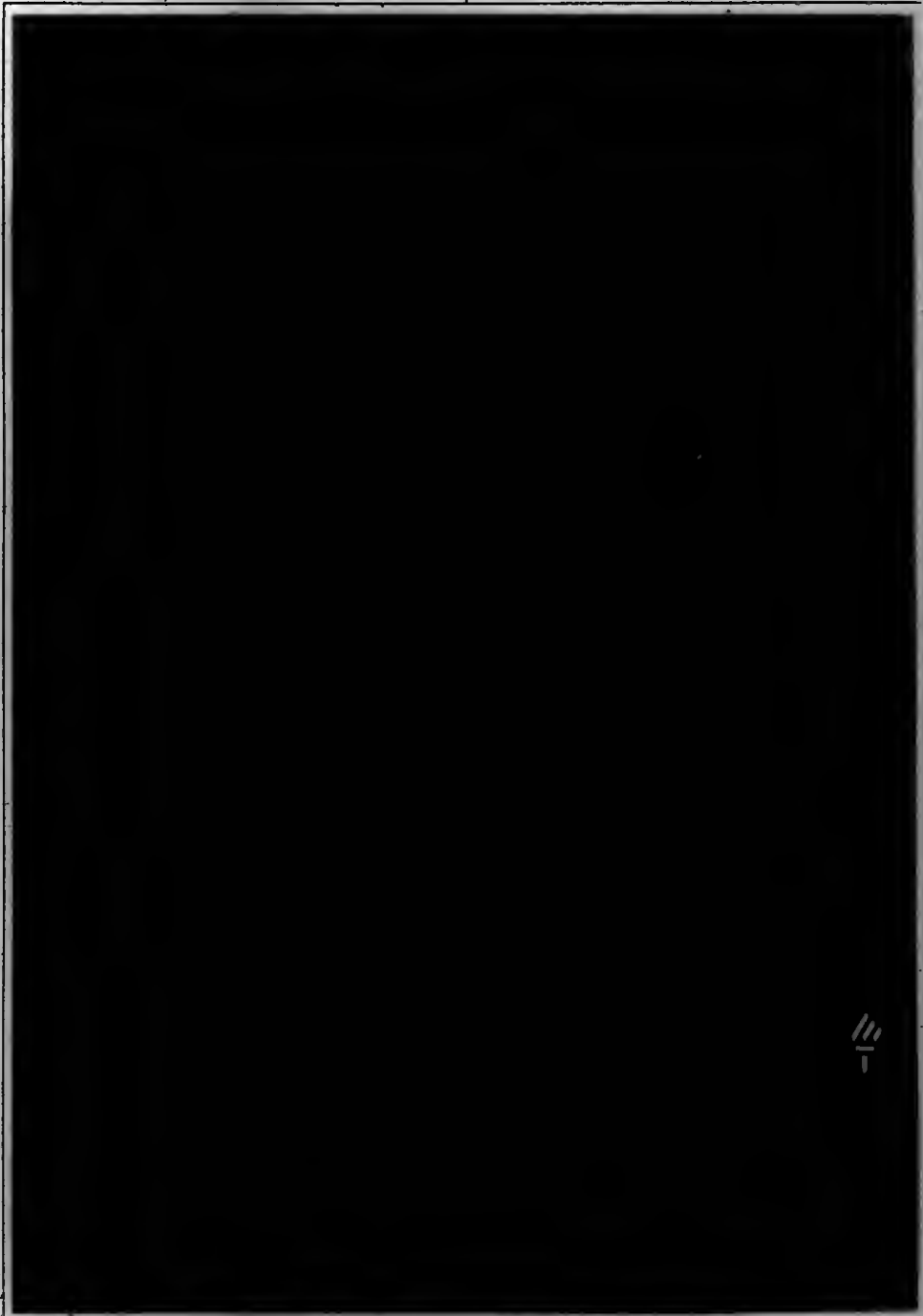
PMC Industries, Inc. has introduced an ac line transient/surge suppressor designed to protect microcomputers and microprocessor-based instrumentation.

According to the vendor, Model 033 is designed to sense and suppress very high-voltage transients, which can cause damage and data scrambling. It features suppression capabilities of 15,000A maximum surge current.

It reportedly works on any standard 120 Vac line and responds to transients and surges in less than 25 nsec.

Model 033 costs $125.

PMC Industries, 9353 Activity Road, San Diego, Calif. 92126.



MICROCOMPUTERS

MICRO SOFTWARE

CUBICOMP CORP.
Easel version

Cubicomp Corp. has introduced a new version of Easel, a graphics software package used to paint full-color images with a graphics tablet.

The package runs on Microsoft, Inc.'s MS/DOS Version 1.1 or 2.0 and requires 500K bytes of memory on an Intel Corp. 8087 coprocessor. It runs with the vendor's CS-5 solid modeling design system for IBM Personal Computers and compatibles.

Easel costs $2,450; the CS-5 graphics system, with graphics display generator, is $9,700.

Cubicomp, 3165 Adeline St., Berkeley, Calif. 94703.

FISCHER INNIS SYSTEMS CORP.
Watchdog

Fischer Innis Systems Corp. has introduced Watchdog, a software-based security product for the IBM Personal Computer running on IBM's PC-DOS Versions 2.0 and 2.1.

According to the vendor, users must provide passwords to verify their access authority when they turn on the computer or log onto the system. Information can be enciphered or scrambled, and the system administrator can order customized audit reports on user activity.

The Watchdog package, consisting of two diskettes with a system administrator guide and a user guide, is priced at $295.

Fischer Innis Systems, 4175 Mercantile Ave., Naples, Fla. 33942.

THE SMALL COMPUTER CO., INC.
Filepro NCR

The Small Computer Co., Inc. has announced Filepro NCR, a data base management system for NCR Corp.'s Tower multiuser microcomputer.

The menu-driven package allows the user to create electronic files, or it can automatically arrange user-defined fields on a screen or report, the vendor said. Data also can be transferred between files.

Other features include conditional processing, recalculations for complete files based on new data, automatic error checking, indexing and file selection functions and file search capabilities.

Up to 15 users can run programs at the same time on the same system in the same file. Security protection is provided at field, screen, file, user or system level. Minimum hardware requirements for Filepro NCR are a Tower with 512K bytes of internal memory, hard disk drive and terminal. It is available at an introductory price of $995.

The Small Computer Co., Suite 1200, 230 W. 41st St., New York, N.Y. 10036.

MICROSPARC, INC.
Lexicom Version 3.0

Microsparc, Inc. has introduced a version of its Lexicom software, a file transfer utility for users of Apple Computer, Inc. microcomputers.

Lexicom Version 3.0 is said to create standard sequential files from

Continued on page 98

S1 from page 83

dowing and bit mapping, graphics and utilities, support for IBM Isam and Vsam file structures as well as B-Tree and removable files. S1 supports all forms of memory management, including virtual memory, they say. Compilers are also available for most major programming languages and even for more esoteric languages like Modula, Snobol and Lisp.

Comments from the few independent observers who have seen S1 bear out the company's claims. "They've taken mainframe operating system concepts and implemented them in S1," said John Farley, manager of software development at IMS International Corp. in Carson City, Nev. Among the more attractive large machine concepts he cited are multiprocessing, communications and the availability of semaphores and locks. He added that he has seen no other micro-based operating system that combines those features.

"From my standpoint the product is phenomenal," Tebbe said. "If it doesn't become accepted, it will be because it doesn't get market recognition, not because of any technical shortcomings."

S1's potential problems arise from the fact that it still lacks a major endorsement, although Lombardo claimed one was imminent. "I'm just surprised if it's so wonderful that more people haven't made commitments to it," said Peter Marvit, senior analyst with Yates Ventures in Los Altos Hills, Calif.

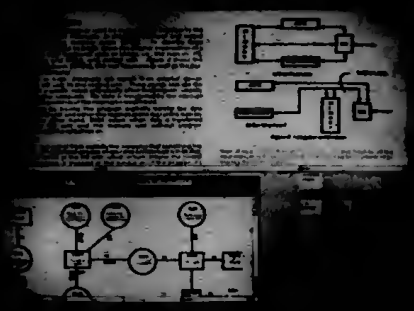
Tebbe pointed out that the product's claimed portability may also act as a hindrance. "To be truly portable you have to sacrifice certain capabilities that different processors have," he said. "But if they had it on [an IBM Personal Computer] with a [Microsoft, Inc.] MS-DOS emulator, they could open a big door."

However, he noted that for a small, two-year-old company like Multi Solutions, a major endorsement promises to be difficult. "If I'm a hardware vendor, why should I buy the heart of my machine from a company like this when I can buy MS-DOS or Unix?" he asked.

Lombardo asserted that the portability of S1 will make it popular with chip vendors. "It takes five man-years to put an operating system on a new chip, and we can do it in nine man-months. They no longer have to build features like networking, multitasking and keyed fields into the applications because that's already in the operating system."

The Star of Team Xerox.

XEROX



The Star 8010 professional workstation has always been known as a computer of dazzling capabilities, especially in its graphics, information processing and document preparation.

Team Xerox

But what some people may not know is that the Star is also the key element in Team Xerox, a system of office machines designed to work together like a team.

When part of an Ethernet network, the Star can work with a wide array of word processors, mainframes, personal and business computers, printers, electronic mail and file services, facsimile terminals, communicating Memorywriters, other networks and, of course, other Stars. It also provides 3270 and TTY emulation.

Its full 17" bit-mapped screen lets you view two full pages simultaneously and open up to six documents at a time without covering up a previous document.

It's also the only workstation that can create and print documents in more than a dozen languages, including Russian and, for the first time, Japanese (Katakana, Hiragana and Kanji).

While other workstations may use Xerox innovations like the mouse, icons, windows, property sheets and combined text and graphics, the Star simply does more with them.

For example, the Star's extensive software is fully integrated, to allow you to work with text and graphics simultaneously. You can draw a flowchart right in the middle of a full page of text without having to resort to a separate program and limited buffer "scratchpad" or "clipboard."

In terms of capabilities, ease of use and overall value, the Star would have to be considered the stellar workstation in the industry.

When Computerworld delivers the goods on manufacturing systems this March 26th, you'll definitely want to be there.

Ad deadline is March 9th.

In response to the increasingly heavy involvement of DP/MIS people in computer-aided manufacturing (CAM) and computer-aided engineering (CAE), *Computerworld* is preparing a Special Report that focuses on CAM/CAE, manufacturing resources planning (MRP), robotics, inventory and shop floor control.

We'll also cover the effect these new technologies are having on traditional manufacturing operations. And on the delicate relationships between traditional DP departments and the factory automation specialists.

If you act before March 9th — your products or services can be represented. To reserve space in this issue, call one of the sales offices listed below or call Ed Marecki, National Sales Director at (617) 879-0700.

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LOS ANGELES/Bob Hubbard, Bill Healey, Bernie Hockswender, (714) 261-1230

Continued from page 92

Apple's DOS 3.3 operating system. The files can be created from several types of files, the vendor said.

Lexicom 3.0 is available for $49.95. Current owners of any version of Lexicom can receive an update for $10 with return of the original disk.

Microspare, P.O. Box 325, Lincoln, Mass. 01773.

DIGITAL EQUIPMENT CORP.
Construction Management System

Digital Equipment Corp. has announced a portfolio of business software packages designed for small- to medium-size commercial contractors using DEC's Decmate II Business Computer System or Rainbow series of microcomputers.

A 10M-byte Winchester hard disk-based Construction Business Management System for the Decmate II reportedly enables contractors to manage 99 jobs, keep track of employees on weekly payroll lists and monitor more active subcontractor accounts than was possible with floppy-based systems. It costs $4,995 and will be available in mid-March.

The floppy disk-based Construction Management System for the Decmate II offers an entry-level automation tool to contractors, DEC said, and has modules for accounts receivable and payable, payroll and job costing. It is available now for $3,500.

Included in the portfolio are Comshare, Inc.'s Target, providing a port chart structure for orderly completion of complicated projects, priced at $329 and available now; and Contractor's Management Systems' Easyest, designed to develop job estimates, priced at $500 and available in mid-March.

DEC, 146 Main St., Maynard, Mass. 01754.

THE COMPUTER CO.
TRS-80 version of APL.68000

APL.68000, an APL interpreter from The Computer Co. that can address up to 16M bytes of main memory, is now available for Radio Shack's TRS-80 Model 16B 16-bit microcomputer.

APL.68000 is an advanced version of IBM's APL.SV interpretive programming language. Features include a system function and Quad-CC, which facilitates development of full screen applications, as well as an APL.68000 "run-time" version for third-party software development.

The TRS-80 16B version of APL.68000 is priced at $1,500, according to the vendor.

The Computer Co., 1905 Westmoreland St., Richmond, Va. 23230.

ARTSCI, INC.
Magic Office System

Artsci, Inc. has introduced the Magic Office System, an integrated office package for Apple Computer, Inc., and Franklin Computer Corp. systems.

The Magic Office System consists of three programs: word processing, an electronic spreadsheet and a spelling checker. The word processor displays the document as it will be printed, the company said. The spreadsheet is a Visicorp Visicalc-type program that will load Visicalc files.

The three products are integrated through a file folder and file cabinet display. Each data diskette is organized into a single file drawer, while multiple diskettes make up multiple drawers.

The system requires 64K bytes of memory, 80-col. display and two disk drives. It is priced at $295.

Artsci, 5547 Satsuma Ave., N. Hollywood, Calif. 91601.

SOFTWARE PUBLISHING CORP.
PFS:Proof

Software Publishing Corp. has introduced PFS:Proof, a proofreader for the IBM Personal Computer.

According to the vendor, PFS:Proof flags misspelled words in a document and provides correct spelling from its 100,000-word dictionary. It also checks for irregular capitalization, double words and typographical errors.

The program can be used with Software Publishing's word processor PFS:Write or any other Ascii text file, the vendor said. PFS:Proof is priced at $95.

Software Publishing, 1901 Landings Drive, Mountain View, Calif. 94303.

See TOOLS page 96

Hewlett-Packa surge in office

Introducing the Person

The principle is simple. Boost the productivity of individual PCs. Your people, your department, even your entire company will follow suit.

The first boost occurred when we introduced the touchscreen HP 150 as an office and managerial workstation. This made personal computing so much easier and faster that individual productivity soared.

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writing, personal filing and calendar functions. And each PC can access data processing systems and large corporate data bases.

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So if PCs alone are making your people more productive, just wait till you see them all working together. And you can see them right now by calling your local HP sales office listed in the white pages. Or write for complete information to: Hewlett-Packard, Dept. 03191, 19447 Pruneridge Avenue, Cupertino, CA 95014. In Europe, contact Henk van Lammeren, Hewlett-Packard, P.O. Box 529, 1180 AM Amstelveen, The Netherlands.

It could turn your whole company into a productivity center.

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TOOLS from page 95

SOFTCRAFT, INC.
Btrieve, Btrieve/N enhancements

Softcraft, Inc. has enhanced its file management systems: Btrieve, designed for a single user, and Btrieve/N, which is used with networking systems.

Enhancements include new file characteristics, sorting capability, more efficient use of disk space and high-speed handling options, according to the vendor. The programs feature variable cache buffers, error control and automatic file recovery, the vendor said.

The programs run on the IBM Personal Computer, Hewlett-Packard Co. HP 150, Wang Laboratories, Inc. Professional Computer and Texas Instruments, Inc. Professional Computer.

Btrieve sells for $245; Btrieve/N costs $595.

Softcraft, P.O. Box 9802, No. 590, Austin, Texas 78776.

METASOFT CORP.
Benchmark packages; Word Processor Version 4.0; Spelling Checker Version 2.0

Metasoft Corp. has announced several business software programs and enhanced versions of its word processing and spelling checker programs for several microcomputers.

Four programs have been added to the vendor's Benchmark series. The Administrator is a directory program that reportedly integrates nine Benchmark application programs. It enables the user to perform configuration and disk formatting and copying procedures as well as interface with most Microsoft, Inc. MS-DOS applications programs and utilities, a spokesman said.

The Financial Planner is a programmable three-dimensional spreadsheet for business planning. The Data Manager is a data base program for storing business and technical information. Business and Presentation Graphics can display data in such formats as a clustered bar chart, a stacked bar chart, a horizontal bar chart, a pie chart, a line graph and an X-Y plot. It also provides the ability to draw freehand and generate arcs, rectangles, circles and text strings, the spokesman said.

Prices are: Financial Planner, $295; Data Manager, $295 to $395; and Business and Presentation Graphics, $295. Word Processor Version 4.0 will be priced between $295 and $350, and Spelling Checker Version 2.0 will cost $125, the spokesman said.

The programs run on the IBM Personal Computer and Personal Computer XT, Texas Instruments, Inc. Professional Computer, Digital Equipment Corp. Rainbow, NEC Corp. PC-9800 and Victor Technologies, Inc. 9000 microcomputers.

Metasoft, Suite 12, 6509 W. Frye Road, Chandler, Ariz. 85224.

WADSWORTH PROFESSIONAL SOFTWARE, INC.
Statpro for Lisa 2

Wadsworth Professional Software, Inc. has introduced a version of its Statpro series of integrated statistics, graphics and data management programs for the Apple Computer, Inc. Lisa 2 microcomputer.

According to the vendor, Statpro contains five modules for statistical procedures. The package runs on a Lisa 2 with 512K bytes of memory. It also runs on the Apple II with 64K bytes of memory, the Apple III with 256K bytes and the IBM Personal Computer and Personal Computer XT with 128K bytes of memory, the vendor said.

The package, scheduled for release in June, is priced at $1,995.

Wadsworth Professional Software, Statler Office Building, 20 Park Plaza, Boston, Mass. 02116.

APPLIED SOFTWARE TECHNOLOGY, INC.
Versaform

Applied Software Technology, Inc. has introduced Versaform for the Corvus Systems, Inc. Concept microcomputer.

According to the vendor, Versaform allows the nontechnical user to automate business application requirements using a form-oriented record.

Versaform, which runs under IBM's PC-DOS or Microsoft, Inc.'s MS-DOS operating systems, is also available for the IBM Personal Computer and Personal Computer XT. The package can also be used on Apple Computer, Inc. Apple II, IIe and III micros, as well as those manufactured by other vendors. The release is written under the UCSD P-system and costs $495.

Applied Software Technology, 170 Knowles Drive, Los Gatos, Calif. 95030.

CDEX CORP.
Training programs

Cdex Corp. has announced two training tutorials for IBM Personal Computer users.

Both products include four diskettes of interactive instruction and a reference of important keystroke sequences and operating system commands.

The goal of the course is an understanding of Basic programming, applications software, fundamental hardware concepts and operating systems. The programs are menu-driven, allowing the user to determine the depth of instruction and the pace at which it is given.

The programs are available at retail outlets for a fee of $69.95 each.

Cdex, Suite 200, 5050 El Camino Real, Los Altos, Calif. 94022.

COMPUTER INDUSTRY

Apple wakes up to reality of IBM

INDUSTRY INSIGHT

PETER BARTOLIK
CW Senior Editor

After mistakenly believing they would storm the business market with the Lisa microcomputer product, Apple Computer, Inc.'s personnel have apparently woken up to the reality of doing business with businessmen.

They're still brash and still very bold. But they've definitely been humbled.

A year ago, it would have been akin to treason for an Apple man to express the idea that Big Blue could 'whup' the blue jeans-clad and long-haired crowd from California. But that's exactly what Apple Vice-President William Campbell admitted, with an IBM man sitting next to him, during a recent seminar hosted by *Fortune* magazine.

"IBM really kicked our tails in that marketplace," Campbell said with refreshing candor. Noting Apple has "not been a serious contender in the Fortune 1000 market," Campbell said the Lisa introduction a year ago "was an aborted attempt." With no mainframe access and no networking and communications capability, the Lisa was destined to fail.

Now Apple is aggressively going after the end-user market, seeking to enter the corporate environment by building up a cadre of supporters who become comfortable with computing via the recently introduced Macintosh. The revamped Lisa family will have a limited networking capability and some ability to pull data from a mainframe, he added.

■

After showing Apple's new ads for the Macintosh and the controversial 1984 ad that ran during the Super Bowl in January, Campbell revealed that Apple tried to pull off the futuristic film, but couldn't sell it all the time.

Thinking that the money for running the ad could be put to better use elsewhere, Campbell said that Apple tried to sell its commitment for 30-second and 60-second spots, but could only find a

See APPLE page 105

IBM portable to impact mart

But Compaq chief expresses little concern

By Peter Bartolik
CW Staff

Compaq Computer Corp. posted earnings of $111 million in its first year after filling a void in the IBM line of Personal Computers with a transportable compatible computer that won much-prized shelf space next to IBM units at large computer retail stores. But IBM recently announced its own portable with a very competitive price.

"I don't think IBM took aim at any particular company, but it probably took note of our success," Rod Canion, president of Compaq, told *Computerworld* shortly after IBM's announcement.

The IBM portable was priced at $2,795 for a 256K-byte random-access memory version with one disk drive, $200 less than Compaq's general retail price for the Compaq Portable Computer.

Canion expressed little concern about Big Blue's move. "There's really nothing new that they've come out with," he said. "They seem to be quite a bit behind us; our first product was announced 15 months ago, and it's certainly behind our second generation product, the [Compaq] Plus."

Shelf space at premium

With retail shelf space at a premium, Compaq is generally regarded as the most successful compatible-manufacturer because it was able to win space in retail stores that deal in IBM Personal Computers. Canion conceded that IBM's latest move has the "potential" to tie up shelf space previously earned by competitors, but maintained, "we've invested a lot the last year in dealer relations and customer satisfaction; we've really become the standard for portables."

He added, "There definitely will be an impact [on available shelf space], and it will hurt those vendors that are not already accepted."

In light of reports that IBM will only ship a limited number of its new portable machines and the fact that the actual "street price" for the basic Compaq is below IBM's announced price, Canion said he believes the company is well positioned to remain competitive. The company is pres-

See COMPAQ page 101

Outside firms training IBM users

By Robert Batt
CW West Coast Bureau

MENLO PARK, Calif. — In a departure from tradition, IBM has appointed four outside training companies to teach users the fundamentals of its Personal Computer systems.

The four firms — Applied Computer Consulting (ACC) in Oakland, Calif; Computerknowledge Corp. of Dallas; PC Support Center Ltd. in Honolulu; and Patricia Ritchie Associates of Burlington, Mass. — are training microcomputer users at selected IBM product centers across the nation.

According to Alan Hunt, manager at IBM's national marketing division in Atlanta, "This is the first time that IBM has gone outside the company to provide a service within the IBM organization. We decided to do it this way because we were not sure we could meet the volume of demand from our own resources."

The training provided by the four companies is designed to give business and professional users of the Personal Computer, Personal Computer XT and PCjr a basic grounding in the various hardware features and software applications of the respective machines.

Users may take introductory or advanced courses in the Lotus 1-2-3 spreadsheet package from Lotus Development Corp.; Visicalc, a program from Visicorp; Multiplan, a financial forecasting package manufactured by Microsoft, Inc.; and IBM's own DOS operating system.

According to the training companies involved, many of the students are first-time users, often from Fortune 1000-type firms.

"Actually getting your hands on the computer from the very beginning is the

See TRAIN page 102

Storage Technology Corp. reported a loss of $40.9 million for 1983, including a $31.5 million expense resulting from cancellation of a mainframe development project/100

FORTUNE

A range of micro distribution channels is best for consumers, an IBM executive said at a recent *Fortune* magazine seminar/104

INSIDE

IBM, CBS, Sears to offer joint home videotex service

NEW YORK — IBM, CBS and Sears Roebuck & Co. announced a joint videotex venture last week to develop a commercial service for home computer users. But the service is unlikely to be available for several years, according to a press release.

Shortly after the announcement, an IBM spokesman said "We will support NAPLPS, Ascii and probably other formats." NAPLPS — the North American Presentation Level Protocol Syntax — is the recently adopted U.S. videotex standard; it specifies the format of the bits that create the graphics displayed on the viewer's screen.

Based largely on Canadian technology, NAPLPS has been promoted in this country by AT&T and CBS. Within the past year, a software-based NAPLPS decoder for the Commodore Business Machines, Inc. Commodore 64 personal computer was developed by Avcor Ltd. of Toronto [CW, July 4, 1983]. Retail sales of the decoder, priced at $100 to $125, began recently.

Last week, Avcor's Marketing Vice-President Zal Press reported his company is developing a similar decoder for the IBM Personal Computer that is expected to be available in about three months. The price will be under $200. Avcor also plans to develop a low-cost NAPLPS decoder this year for the IBM PCjr.

At least four other companies, including two in the U.S., are developing and marketing software-based NAPLPS decoders for personal computers, Press added.

The possibility of using the Personal Computer as a videotex terminal may have been a major reason CBS teamed up with IBM and Sears. Earlier, in collaboration with AT&T, CBS sponsored "Venture One," a videotex trial in Ridgewood, N.J. But the terminal was an expensive, specially built television set supplied by AT&T.

The phone company is marketing a similar terminal in Miami, where Knight-Ridder Newspapers recently began Viewtron, the nation's first commercial videotex service. The Viewtron terminal is priced at $600, but reportedly costs much more than that to build.

STC reports net '83 loss of $40.9 million

LOUISVILLE, Colo. — Storage Technology Corp. (STC) recently reported a net loss of $40.9 million for 1983, reflecting sharply reduced revenues and a $31.5 million expense resulting from the recent termination of a mainframe development project.

With its stock hovering at the $12 mark, down from a high of $40 two years ago, the losses reported for 1983 represent a per-share cost of $1.19.

STC reported that revenues for the year were $886.6 million, down 17.8% from the $1.07 billion reported a year earlier. In the fourth quarter, revenues were $226.9 million, down 19.1% from the fourth quarter in the previous year.

For the year, the company reported losses of $9.4 million, or 28 cents per share, from ongoing operations, and losses of $31.5 million, or 91 cents per share, from the ill-fated attempt to develop a high-range, IBM-compatible mainframe [CW, Feb. 6]. In the fourth quarter, losses from ongoing operations were $7.8 million, or 23 cents per share, and losses from the mainframe project were $27.6 million, or 80 cents per share, for a net quarterly loss of $35.4 million, or $1.03 per share.

In 1982, STC had posted profits of $64.7 million, or $1.88 per share, and fourth-quarter profits of $8.1 million, or 25 cents per share.

STC Chairman Jesse I. Aweida said the decision to cancel the mainframe project was disappointing but unavoidable in light of program delays, the reduced likelihood of successfully marketing the project and the additional funds that would have been required to complete it.

Class-action suit

STC has been served with a federal class-action suit filed by a member of the partnership which the company formed to raise funds for the project, charging the company fraudulently obtained an additional $10.6 million in funds just four months before the decision came to cancel [CW, Feb. 13].

The company has not publicly commented on that suit.

Commenting on the impact the 1983 losses might have on 1984 operations, Aweida said the company's creditors had been kept fully informed of the mounting losses. "Our credit needs are well within the resources available to us," he said.

Aweida added that products recently introduced by the company are being well received by customers and that he expects the products to continue to do well in the marketplace.

TRANSPORTABLES[1]

Microcomputer	Weight (Lbs.)	RAM	Bits	Operating System	Storage	Display	Price as of 2/84
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Computer Devices, Inc. Dot 3000 A	27	64K	16	MS-DOS	1 Floppy Drive	10 in.	$3,220
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]							
Non-Linear Systems, Inc. Keypro 10		64K	8	CP/M	1 Floppy Drive 1 Hard Disk	9 in.	$2,795
Keypro IV		64K	8	CP/M	2 Floppy Drives	9 in.	$2,795
Otrona Corp. Attache	20	256K	16	CP/M MS-DOS	2 Floppy Drives	5¼ in.	$3,795
Radio Shack/Tandy Corp.[2] TRS-80 Model 4P	26	64K	8	TRS-DOS[3]	2 Floppy Drives	9 in.	$1,799
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Televideo Systems, Inc.[2] Jukebox I	30	64K	8	CP/M	2 Floppy Drives	9 in.	$1,999

Shaded Machines Indicate IBM Personal Computer Compatibility
[1] Source: International Data Corp.
[2] Data Provided by Vendor.
[3] MS-DOS from Microsoft, Inc.
[4] CP/M, CP/M 86 from Digital Research, Inc.
[5] TRS-DOS from Radio Shack.

Canion urges compatibility with standard

By Patricia Keefe
CW Staff

HOUSTON — "Don't jump in front of a speeding train, and if you sleep in the same room with an elephant, make sure you are awake before he is."

In this way, Rod Canion, Compaq Computer Corp.'s president and co-founder, talked about competing in an IBM-compatible microcomputer world at the recent PC World Exposition here. Compaq is one of the more successful makers of IBM-compatible microcomputers.

Canion said that IBM's Personal Computer is a de facto industry standard independent even of IBM, primarily because of the amount of business software written for it by third-party vendors. As a result, he predicted, IBM, too, will think twice about making any future architectural changes to its Personal Computer for fear those changes will make it incompatible with the mother lode of software written to run on the current Personal Computer architecture.

Canion said that while some vendors have chosen to ignore the standard and others merely "dabble" in it, Compaq's success comes from recognizing the standard. Canion said micro vendors should be 100% compatible with the standard; paying lip service with halfway "compatibility" is not enough.

Truly compatible to Canion means the capability to run all software as is, off the shelf; same keyboard and program layout; operating system; support for the same peripheral devices; and utilities and documentation commands.

"I don't think you should stand on the tracks in front of a speeding train [IBM] with a flag to stop it. Instead, you should climb on board and work your way [via compatibility/improvements] to the front," he said.

Some areas in which he suggested improvements could be made were cheaper graphics, a reduced footprint, networking and faster and more memory capacity and storage.

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ently doubling manufacturing capacity and is pushing the Compaq Plus with hard disk and 10M-bytes of memory.

Canion would not comment on whether the company intends to discount its first model to increase its attractiveness to consumers. "We will do what is appropriate," he said.

IBM's new product was announced just a few weeks after it won its first skirmish against previously ignored Personal Computer-compatible manufacturers.

Late last month, IBM filed lawsuits charging Corona Data Systems, Inc. and Handwell Corp. with infringing on copyrighted routines used in the IBM Personal Computer, and both agreed to redesign their products.

"It is our intention to protect our copyright," IBM spokesman Ed Nanas told *Computerworld*.

Nanas said the settlement recently obtained by Apple Computer, Inc. in its copyright suit against Franklin Computer Corp. [CW, Jan. 23] did not affect IBM's decision to prosecute. But it did influence Corona to settle: "We decided that rather than fight the case, the best route was settlement," said Larry Lotito, a Corona spokesman.

Corona subsequently announced it would begin shipping a new read-only memory that it said does not infringe upon IBM copyrights.

COMPUTER INDUSTRY

DEC restocks exec team by promoting nine managers

MAYNARD, Mass. — Digital Equipment Corp. recently restocked its executive team by promoting nine senior managers to vice-presidential positions. Each has been with the company for 10 years or longer.

Promoted, effective Feb. 15, to vice-presidents, were:

■ John L. Alexanderson, 44, Peripherals and Supplies Group. Previously manager of that group, he joined DEC in 1969 and served in a succession of sales and marketing management positions.

■ Don K. Busiek, 48, Corporate Software Services. Since joining DEC in 1969, he held various management positions in field-service technical support and product support groups before assignment as manager of Corporate Software Services.

■ Gerald V. Butler Jr., 43, Computer Special Systems. After joining the company in 1966, he held various marketing, engineering and general management positions, including manager of PDP-15 engineering, and was most recently manager of Computer Special Systems.

■ David W. Grainger, 41, area manager — Western and Central states. Most recently area manager for the Western and Central States Management Center, he had served as regional manager for Northern Europe, regional manager for the Mid-Atlantic states and U.S. field-service manager since joining DEC in 1969.

■ Delbert E. Lippert, 41, Educational Services. He had been manager of Corporate Educational Services since 1974 and held a succession of field-service management positions since joining the company in 1967.

■ Charles E. Shue, 37, area manager — Northeast states. He joined DEC in 1970 and held various district and regional sales management positions and was most recently area manager for the Northeast Area Management Center.

■ Peter J. Smith, 39, Computer-Aided Engineering and Manufacturing. Formerly manager of that group, he joined DEC in 1970 and served in various marketing management positions.

■ Harvey L. Weiss, 40, area manager — Mid-Atlantic and Southern states. Most recently area manager for those states, he joined the company in 1971 and served as marketing manager of the Large Computer Group and product group manager of the Government Systems Group.

■ Richard H. Yen, 53, Far East Engineering and Manufacturing. He joined DEC in 1972 and served as general manager, Taiwan, and director of Far East Manufacturing before becoming manager of Far East Engineering and Manufacturing.

HP posts 12% increase in first-quarter profits, but costs rise 23%

PALO ALTO, Calif. — Hewlett-Packard Co. recently reported that profits for the first quarter of the fiscal year were $95 million, or 37 cents per share, up 12% from the $85 million, or 34 cents per share, reported in the corresponding period one year ago.

At the same time, however, total costs and expenses during the quarter were $1.1 billion, up 23% over the year-earlier report. John A. Young, president and chief executive officer of HP, said that incoming orders outpaced the expenses and are expected to generate increased sales growth.

For the quarter, the company reported sales of $1.2 billion, up 21% from the $1.05 billion reported a year earlier. The largest increase, 26.4%, or $144 million, resulted from sales of computer products; sales of electronic test and measurement equipment climbed 18.3%.

International orders also increased by 32% over the year-earlier figures, but part of that, about five percentage points, was due to HP's increase in equity from 49% to 75% in Yokogawa-Hewlett-Packard, a joint-venture company based in Tokyo, Young said.

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only way we have found to ease the fear of computers that many users experience," explained Nancy Ciano, president of ACC.

ACC conducts training sessions at IBM centers in five western states, listing one of its biggest customers as Pacific Gas and Electric Co. According to Al O'Connor, supervisor of administrative services for the utility, over 100 professional staff members have been trained, including six senior managers.

"As a result of the ACC courses, our people have been coming up with new ideas and ways to increase productivity and effectiveness, and we have expanded the use of our Personal Computers into areas where hitherto they were not used — for example — in presentation graphics," he claimed.

O'Connor said the Personal Computer training was instrumental in the formation of several microcomputer users groups within the company designed to act as forums for sharing new applications and ideas and for resolving problems.

At the IBM product center in Honolulu, the PC Support Center courses are geared a great deal toward managers and professionals working in financial areas, such as the controller's office.

Andy Friedlander, president of Monroe & Friedlander, Inc., a Hawaiian-based commercial and industrial real estate company, recently completed an introductory course there.

"In order to remain at the forefront in this business, we must stay on top of technological developments in the personal computer industry. I felt I would be left behind in my own company if I did not come to grips with computers. The introductory course on the [Personal Computer] gave me the confidence of knowing that I can learn a great deal very quickly."

For Computerknowledge, the IBM contract has created the opportunity for establishing business relationships in 56 Big Blue product centers in the eastern half of the U.S. According to company president, David Barrie, business has been so lucrative that the company is now designing courses to train users who plan to integrate their micros with the corporate mainframes. Contracts have been signed with Informatics, Inc. and Information Builders, Inc., with the first sessions due to begin in April.

According to one IBM user, multimillion-dollar publisher Prentice-Hall, Inc., the use of outside training companies is a decided advantage. "With a firm such as Computerknowledge, what you get is pure training. It trains people rather than promotes or sells products, and it is able to present the material in a way that is attentive to the level of user in the classroom," asserted John Kilcullen, market sales coordinator.

'We're just trying to find out how much tape is really on the reel'

Anacomp restructures $44.6 million loan

INDIANAPOLIS — Anacomp, Inc. recently restructured its $44.6 million loan, reported a $38.9 million loss for the quarter ended Dec. 31 and announced the termination of a top executive.

Five member banks restructured $44.6 million in revolving-credit loans into term loans and provided the company with an additional $6.2 million credit line. Anacomp was in danger of defaulting on the revolving-credit loan.

The restructured loan permits the sale of Anacomp assets. According to a company spokesman, Anacomp has raised $5 million from the recent sale of some assets.

The company's latest loss followed a $12 million loss in the third quarter, according to the spokesman.

Anacomp's fiscal problems reportedly are linked to its late delivery of its Continuous Integrated System (CIS), an interactive, on-line data base banking system.

Anacomp officials claim that CIS was delivered in December and is being used on a limited basis by the Provident National Bank in Philadelphia. Bank officials refused to comment on the system.

In early February, John J. Flanigan, the company's chief operating officer, was terminated and his position eliminated. Ronald D. Palamara, chairman, president and chief executive officer, assumed responsibility for the company's daily operation, the company spokesman said.

Micro marketing strategies analyzed for '80s

NEW YORK — IBM believes microcomputer consumers "are best served by having the widest range of [distribution] options available to them," a company executive said during a recent seminar here sponsored by *Fortune* magazine, at which several players in that marketplace stressed the value of marketing strategies.

Charles E. Pankenier, director of communications for IBM's Entry Systems Division, made that remark at *Fortune*'s seminar, "The PC Revolution in Business — Marketing Strategies for the '80s." Joining him at the podium were representatives of Apple Computer, Inc., Lotus Development Corp., Computerland Corp. and International Data Corp. (IDC).

Joseph L. Levy, vice-president of corporate marketing for IDC, said consumers "don't want to be computer experts . . . our job is to forget about some of this technology we're so in love with."

'A gamble'

IBM's Pankenier said IBM's decision to jump into the micro market "was a gamble with some risk involved." Well conditioned to selling large systems to technical managers, Big Blue had to deal with "a new type of product, new channels of distribution and a new audience," he said. To reduce consumer apprehension about computers, IBM introduced the Charlie Chaplin advertising character to "warm up" people both to the product and to the company, Pankenier said.

A variety of distribution channels will serve consumers, he added, but vendors have to convince end users that they need the product. "Up to now [IBM's Personal Computers] have been bought; from here on out they will have to be sold . . . our job is to take technology and turn it into a utility," he said.

William V. Campbell, vice-president for sales and former vice-president of marketing for Apple, said his company is seeking to enter the large business market by sidestepping the established DP departments. "We're not going after the MIS director; we're going after people, and we're calling them knowledge workers," he said.

Commenting on Apple's 100-day, make-it-or-break strategy to sell the recently introduced Macintosh, Campbell said Apple is seeking "mainstream acceptance" with an easy-to-use product that will provide an alternative to IBM. By selling the product to "knowledge workers of the future — college students" and to professionals who would like a productivity aid on their desk, Apple does intend to "be accepted to some extent by the office market," in the long haul, he said. That acceptance will focus on the Lisa products, and "Mac is the building block to that."

Christopher Morgan, vice-president for communications at Lotus, said his company identified a distinct profile of users, with the majority being middle managers and professionals in all companies. He said Lotus spent what is believed to be a record amount in advertising to launch the highly successful Lotus 1-2-3 product and hopes to continue the trend with the just-announced Symphony by accomplishing "one major task — to make a complex-appearing product be as simple and as straightforward as possible."

Dealing with consumer perceptions was also addressed by C. Roger Lewis, vice-president of marketing for Computerland. He said Computerland had determined that most consumers do not know what to expect from a computer retail store. "It's the role of the manufacturer to create demand . . ."

SUPERSHORTS

London-based Thorn EMI Information Technology Ltd. has formed Thorn EMI Computer Software, Inc., headquartered in Costa Mesa, Calif., which will publish and market personal computer software for business and home use in the U.S.

■

Xerox Computer Services will provide on-line remote time-sharing services to Gendex Corp. of Milwaukee, a manufacturer of dental X-ray equipment. The services will include integrated financial applications for the planning and management of manufacturing and distribution. Gendex recently acquired the dental X-ray business formerly owned by General Electric Co.

■

Direct, Inc. has signed a service contract with Xerox Corp., naming Xerox as an authorized contractor for Direct's installed base of integrated personal computers in the U.S.

■

Comtrom of Concord, Calif., has been awarded a contract to supply AT&T Information Systems, Inc. with DS-1 voice and data multiplexers. AT&T will offer Comtrom's D/I MUX as an enhancement to its product line under the name DS-1 Channel Multiplexer.

■

Cray Research, Inc. has sold a Cray-1 S/1000 computer system, valued at $7.1 million, to Sandia National Laboratories, a multiprogram research and development organization that operates a no-fee, no-profit contract for the U.S. Department of Energy. The system will be the third Cray system installed for Sandia and the second such system installed at Sandia's Livermore, Calif., location.

■

Auto-trol Technology Corp. has announced the formation of Auto-trol Development Ltd., a limited partnership to fund the development of a comprehensive software system for process plant design. The $7 million private placement was managed by Hambrecht & Quist, Inc. of San Francisco.

■

Burroughs Corp. has announced an agreement in principle with the University of Michigan's Graduate School of Business Administration to provide approximately $6 million in hardware, software support and services for a new computer network. The school will contribute $6 million in new facilities and equipment. The projected installation date for the new network, which will be tied into two existing university computer networks, is September 1984. Burroughs will also sell micro workstations at "substantially reduced prices" to faculty, staff and students.

■

Modular Micros, Inc., a subsidiary of Modular Computer Systems, Inc. (Modcomp), has discontinued production and marketing of the Zorba portable computer. Modcomp will continue to service the Zorba portable personal computer through its nationwide service organization.

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buyer for the 30-second spot and decided to go for it. In light of the publicity created by the ad, the firm is glad it couldn't pull it off, he said.

Although almost everybody in the industry thinks Apple's Big Brother was supposed to represent Big Blue, Campbell claimed "the ad was on the boards even before we knew IBM was going to beat our brains out."

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We can offer competitive salaries, extensive company-paid benefits, and excellent potential for professional recognition and advancement. For prompt consideration, please send your resume in confidence to:

Staffing Manager
Dept. CW 229 R
Digital Switch Corporation
P.O. Box 830911
Richardson, Texas 75083-0911

equal opportunity employer

HELP WRITE A BOLD NEW CHAPTER IN TELECOMMUNICATIONS HISTORY

DEVELOP YOUR FUTURE AT CANDLE CORPORATION

CANDLE CORPORATION is a multi-national high technology company and developer of OMEGAMON®. We have several exciting opportunities for qualified individuals to join our expanding team of professionals.

Sr. MVS Software Developers

If you have a desire to get away from SMP installs and third shift system outages that interrupt your sleep or want career advancement without getting into management, then build your future by developing quality systems software at Candle.

Qualified applicants will have strong IBM Assembler programming skills and good knowledge of the internals and performance consideration of the MVS operating system.

Please call or send your resume to: Joe Winterton, 2 Garnett Drive, Suite L-1, White Plains, NY 10604. (914) 694-1048.

Technical Support Specialists

We're seeking support specialists to be the technical interface between Candle and its customers. Requirements include extensive knowledge of MVS and either IMS or CICS operating systems experience. Knowledge of performance and tuning concepts also desired along with excellent communication and presentation skills.

Please call or send your resume to: Barry Weinstein, 777 Third Ave., 32nd Floor, New York, NY 10017. (212) 888-6666.

CANDLE offers an excellent compensation and benefits portfolio as well as an opportunity to work with some of the top software professionals in the world.

We also have other similar positions available in our So. California offices. Please contact Joel Presnell, 10889 Wilshire Blvd., 8th Flr., Los Angeles, CA 90024. (213) 478-8277.

Equal Opportunity Employer

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Our client, located at a beautiful site in Northern California, is the leader in its industry and a company you can be proud of.

Due to expected expansion, the realtime applications environment is to be redesigned to accommodate new services and large volume increases. This is a ground floor fresh opportunity to be in from the start on this several year project.

Excellent compensation, benefits, thrift plan. Relocation assistance. Professional working environment with outstanding office facilities. For confidential consideration, please submit resume to: Realtime, 1281 Howard Ave., Suite 102, Burlingame, CA 94010, or call Sam Parisi (415) 579-8888. Equal Opportunity Employer. Employer retained.

Realtime Associates
Agency of Northern California

EXECUTIVE INFORMATION PROCESSING

A key governmental agency, recognized nationally as a leader in its field, is currently seeking a highly skilled professional to assume control of a 7 million dollar "state-of-the-art" information processing bureau. Candidates should possess data processing, word processing and personal or micro-computer applications background plus a significant management expertise which includes comprehensive management analysis and productivity analysis skills. The individual selected will develop both short and long range plans and implement a comprehensive data processing system, to meet the needs of both Administrative and Engineering areas. For details send resume immediately to Mr. Richard Hanley

STATE OF ILLINOIS - CMS
Executive Recruitment
[illegible] Building **Springfield, IL 62706**
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LEAD PROGRAMMER ANALYST
LOAN APPLICATIONS

FIS, a large financial Data Processing Center in Central Florida, seeks an individual with extensive knowledge in loan applications along with 6-8 years experience in COBOL programming in a development and maintenance environment. Strong communicative, interpersonal, and communication skills required in addition to experience with large Burroughs hardware and Data Base systems. Project management and control skills needed. Excellent salary and fringe benefits. Send resume and salary requirements in confidence for

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(Search Extended)

This is one of three top level Computing Center management positions that reports to the Director of Computing and is responsible for the Operations, Input/Output Control, and Maintenance Group within the Computing Center. This Data Processing Operations position is responsible for a variety of traditional and non-traditional computer activities that require innovative administrative and management skills. A staff of 10 report to this position.

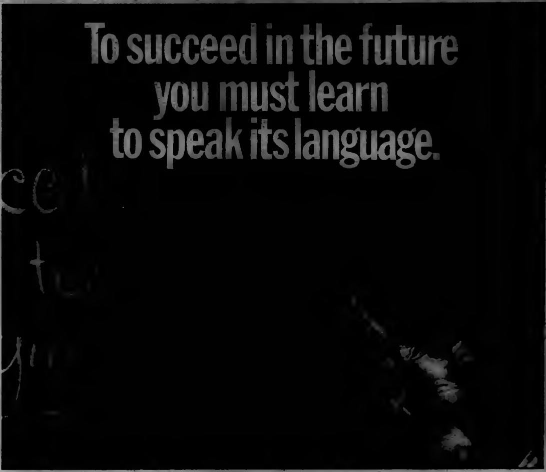
Requirements include 3-5 years of management experience in computer operations or a closely related area; experience in organizational development, hardware planning, and defining operations procedures; highly developed oral and written communications skills; demonstrated supervisory capabilities; and a baccalaureate degree. An advanced degree is highly desirable.

This position is to be filled as soon as possible. Salary offer will be commensurate with experience and qualifications. Fringe benefits include a generous pension program, fully paid medical and long term disability insurance, one month vacation, life insurance and tuition support for children.

Interested parties should submit resumes by March 15 to:

George M. Steeds
Director of Computing
Oberlin College
Oberlin, OH 44074

Affirmative Action, Equal Opportunity Employer



Everyone involved with computer software will come to know *Ada*. The U.S. government, the largest consumer of software in the world, has already selected *Ada* as its language of preference. Widespread use of *Ada* throughout industry and business is assured.

OUR COMMITMENT TO EXCELLENCE

Martin Marietta is committed to a future of computer software excellence. And *Ada* is part of that future. For us, it's more than a new language, it is a new beginning. But our commitment to becoming the software center of excellence requires exceptional people—people who don't wait for the future, but work to create it.

STEP INTO THE FUTURE

Martin Marietta is now looking for software professionals to move ahead with us, to step into the future and help lead the way. There are already many opportunities to work with *Ada* as we explore its many applications. We have even started intensive on-site education for our employees, including a full-time, 13-week introductory program.

So, if you want to succeed in the future, come to where we already speak its language.

WE CURRENTLY HAVE THE FOLLOWING POSITIONS FOR SOFTWARE PROFESSIONALS AVAILABLE:

[illegible]
Microprocessor firmware design. Intel 8086 type assembly language experienced required.

[illegible]
CAD software development; VLSI and LSI design and implementation; VAX/VMS experience preferred.

[illegible]
Control system design and robotics, including control system analysis, software design, programming, test and integration, and fabrication.

[illegible]
Communication System Engineering, Military Command and Control, and Voice Data Communications. Design and implementation of microprocessor based communication network architectures. Includes communication system analysis and requirements generation for Message Handling, Accountability, Integrity, Security, and Switching, Local Area Networks (LANS), C^3 Systems, MMI, and System Control Monitoring.

[illegible]
Experience in mathematical modeling and analysis of C^3 and C^3I systems, communications traffic models, security models and data acquisition.

[illegible]
Experience in spacecraft flight software, RF software, mission operations software, real-time process control software, and real-time closed loop simulation applications.

[illegible]
Systems programming (internals) experience on virtual memory operating systems and real-time executives for both mini-computers and large mainframes. Performance monitoring and management experience of particular interest. UNIVAC, DEC, HP, IBM, MODCOMP, and SEL experience is desired.

[illegible]
Developing and maintaining technical baselines for software configurations.

[illegible]
Expertise in requirements specification, DBMS selection, design programming. Experience in DBMS languages, theoretical and conceptual DB analysis, and DB security.

[illegible]
Experience in architecture selection, distributed systems, human-machine interface, display technology, computer security, fault tolerant architecture (Assessment, Validation, Software Development, Modeling.)

[illegible]
Flight software algorithm development, implementation, and checkout.

[illegible]
Experience with IBM and/or UNIVAC COBOL based systems highly desirable.

[illegible]
Artificial Intelligence design with LISP programming experience.

[illegible]

[illegible]

If qualified for any of the above positions, please send a confidential resume to: Martin Marietta Denver Aerospace, P.O. Box 179, L1311, P582, Denver, CO 80201. No agencies please, we prefer talking to the individual.

U.S. [illegible]

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Can an Information Systems Analyst build a career on world-class aircraft engines?

Yes!

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You'll be involved in the design and implementation of new or improved manufacturing information systems of key importance to our operations. The work requires an ability to define and interpret needs; and the capability to apply innovative solutions to complex problems. You'll also be concerned with determining computer hardware/software feasibility and compatibility with operational and planned systems; integrate assigned systems activities with other Information System, Computations and functional personnel.

Be prepared to lead

Solid credentials are needed. You should have a degree, preferably in Computer Science (or equivalent work experience); demonstrated project leadership; and well developed communications skills.

Your experience must include a thorough grasp of mini-micro computer applications and structured DB techniques. You should also present prior applied Cobol experience and have held major responsibility for the design, programming, testing and implementation of business systems on large/small scale general purpose computers; PRIME computer experience especially desirable.

Besides stimulating work...

what can you anticipate? Strong technical support... a salary base tied to these upscale responsibilities... comprehensive benefits... and career mobility within a highly successful organization.

Whom to contact

Send resume with salary history to Mr. Warren Green, Ref. 34-W, General Electric Aircraft Engine Business Group, 1000 Western Avenue, Bldg. 1-4509, Lynn, Mass. 01910.

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AT FAIRCHILD WESTON: INDIVIDUALS HAVE PROJECT RESPONSIBILITY

Look to Fairchild Weston if you seek the individual challenges, responsibilities and rewards of seeing projects through from start to finish. For 30 years, we've been the leader in SMR telemetry, signal processing and data acquisition systems. Our technological excellence and innovation have resulted in steady sales growth, creating exciting career opportunities for experienced engineering and/or computer science professionals.

The following positions require U.S. citizenship, and extensive background investigations may be conducted:

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An exciting career opportunity exists for an individual experienced in software quality assurance. We seek a person with strong leadership skills to develop and head our software Q.A. function. Experience with real-time software specifications, design, development and documentation desired. Experience with software Q.A. mil-standards required. The successful applicant will develop and implement a Q.A. program for our system software products. A BSEE or BSCS or applicable experience preferred.

SOFTWARE SPECIALISTS

Positions require experience in the design and implementation of large scale real-time systems utilizing structured methology. Experience with VAC-11, RSX-11M or VMS operation systems and assembly language/FORTRAN required. Knowledge of signal processing, graphics, data base implementation or large scale netted computer systems is highly desirable. Project leader position requires prior experience with proposal generation and cost estimating.

Fairchild Weston offers top compensation, liberal fringe benefits, relocation assistance, and a casual but challenging work environment.

Sarasota is a beautiful beach community on Florida's Gulf Coast. Sarasota enjoys a respected school system, attractive residential communities, a low tax structure, no state income tax, and a year 'round recreational climate.

For confidential consideration, please submit your resume, including salary history, to: Tom Selmon, Manager, Professional Employment.

FAIRCHILD WESTON SYSTEMS INC.

PO Box 2501
Sarasota, Florida 33578

An Equal Opportunity Employer

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AN OPPORTUNITY TO BE CREATIVE

That's what we offer Systems Analysts, Designers and Programmers. Your entry requires extensive experience and current knowledge of modern technology, techniques and languages in the super mini/mini/micro area.

The best qualified candidates for this entrepreneurial opportunity also have experience in local networking, data communications, and application support of financial institutions. The quality of experience counts more than the quantity. The independent, high-energy individuals who work with us earn their way. They receive excellent compensation and benefits for their success in finding creative solutions that stretch their talents.

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S & L COMPUTER TRUST

ATTN: Human Resources Department
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Responsible for the design, development, testing, modification and documentation of process control software. Provides system installation, maintenance and troubleshooting service. Keeps current with hardware and software developments that are revelant to process control systems.

This position is in the software development group of the Process Automatpn unit, located in Houston, whose responsibilities include the instrumentation and automation of the company's manufacturing facilities worldwide.

Requirements include a BS degree in Engineenng, Computer Science or Math with minimurg of three years previous experience in developing real-time process control software using FORTRAN and Assembly languages. Experience in the petrochemical industry and with MODCOMP equipment preferred. Strong interpersonal and problem solving skills are essential. Sume travel, both domestic and international, required.

Please forward resume and salary history to:

Shirley G. Arline
Employee Relations Supervisor
ARCO Chemical Company
Division of Atlantic Richfield Company
3801 West Chester Pike
Newtown Square, PA 19073

ARCO CHEMICAL COMPANY

An Equal Opportunity Employer

DIRECTOR OF COMPUTING AND INFORMATION SYSTEMS

The Director is responsible for computing and information processing systems for the Board of Regents. The Board oversees twenty seven public colleges and universities in Massachusetts. Applicants must have 5 to 10 years of relevant programming, communications and systems development experience. A sound knowledge of DBMS Technology and MIS in a complex higher education governing board environment, and strong managerial and communications skills are required. A Master's Degree in Computer Science or equivalent degree is also required. Familiarity with Cyber mainframe technology is desirable. Salary and Benefits are competitive.

Send resume and cover letter to: Director of Management Systems, Board of Regents of Higher Education, McCormack Building, Room 919, 1 Ashburton Place, Boston, MA 02108-1530. *EEO/AA Employer*

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New York City based computer sales/leasing company requires aggressive, dynamic, highly motivated sales person. Individual must have proven sales track record with equipment of major computer equipment manufacturer. This is a start-up branch operation for a major European computer sales and leasing company. Opportunity for the right person for high earnings and quick advancement to branch manager responsibilities. Send resume to:

CW-B4672
Computerworld
Box 880
Framingham, MA 01701
or call (212) 319-6000.

DATA ADMINISTRATOR
U.S. Dept. of the Interior
Washington, DC

The Department of the Interior is seeking a Data Administrator to develop and implement a departmentwide data administration program. The responsibilities include policy development, strategic planning, data standards development and development of data dictionary/directory resources. Salary range $42,713-$55,538 depending on qualifications/experience. Call 202-343-4821 for a copy of vacancy announcement or write: U.S. Dept. of the Interior, Division of Personnel Services, Room 5464, 18th & C Streets, NW, Washington, DC 20240. SF-171, Personnel Qualifications Statement, required. Closes: 3/26/84. Equal Opportunity Employer

PROGRAMMER - Design/impl. ticker processing system for info. on Stock Exchange. Maint./enhance system & provide vital skills to ensure effic. operation. 2 yrs. or 2 yrs. in systems maintenance. Bach. degree in Engin. or Comp. Sci. Knowl. ASSEMBLER on Data-General Minicomputers, FORTRAN & "C". $25,000 p.a. 40 hrs/5 days/wk. Reply to CW-B4569, Computerworld, Box 880, Framingham, MA 01701.

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We are extending the technology of MIS and system support, applying new sophistication to marketing and service management. We have literally scores of openings, at many levels, in many fields, based in New Jersey. And the building of this organization and the full development of its capabilities will go on for years.

We've put together this check-list application, so you can quickly, and easily, tell us your areas of expertise. We'll then be in a position to inform you of job matches as they occur—immediately, or in the months ahead.

Don't delay. The completed application, attached to your resume, could launch you on a rewarding career based on the future of telecommunications. Send to Box CW-B4583, Computerworld, Box 880, Framingham, MA 01701. (We regret we cannot pay agency fees.)

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AT&T Information Systems

HARDWARE

- ☐ IBM 308X (3, 1, 4), 3033, 3080XS, 3084, 3705
- ☐ IBM 303X, 3081X
- ☐ DEC VAX 11/780, PDP 11/70
- ☐ DEC 11/70
- ☐ IBM 3705
- ☐ COMTEN 3690
- ☐ CCI VARIAN
- ☐ Microcomputers

LANGUAGES

- ☐ COBOL
- ☐ FORTRAN
- ☐ PL/1
- ☐ APL
- ☐ BAL
- ☐ SAS
- ☐ EMPIRE
- ☐ FOCUS
- ☐ ADRS
- ☐ APLDI
- ☐ C

DBMS

- ☐ Model 204
- ☐ IMS/DB

SYSTEM/ NETWORKING ENVIRONMENTS

- ☐ IMVS/SP
- ☐ MVS/XA
- ☐ VM/CMS
- ☐ VM/SP
- ☐ EMPIRE
- ☐ FOCUS
- ☐ SMP-4
- ☐ TSO
- ☐ ISPF/PDF
- ☐ JCL
- ☐ Utilities
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- ☐ TCAM
- ☐ BTAM
- ☐ VSAM
- ☐ UCC-X Products
- ☐ VAX/VMS
- ☐ IBM DATA Dictionary
- ☐ APLDI
- ☐ SAS
- ☐ MVS/VM
- ☐ CICS
- ☐ IMS/DC
- ☐ UNIX*

*Trademark of AT&T Bell Laboratories

FUNCTIONS

- ☐ MIS
- ☐ Hot Line System Support (user problem solving)
- ☐ Financial
- ☐ Payroll
- ☐ Accounts Payable/Receivable
- ☐ Order Entry/Billing
- ☐ Inventory
- ☐ Software technical support
- ☐ Personnel Information & Services
- ☐ Performance Measurement
- ☐ Capacity Planning
- ☐ Marketing Support
- ☐ Internal Networking
- ☐ Computer Operations
- ☐ Systems Tuning
- ☐ DASD Management
- ☐ Data Security
- ☐ Long Range System Planning
- ☐ Modelling
- ☐ Systems Architecture
- ☐ Data Administration
- ☐ Application and Data Architecture
- ☐ Network Planning
- ☐ Hardware Planning
- ☐ System Software Planning
- ☐ AOS Planning
- ☐ System Consulting
- ☐ Information Center USER Counseling
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I have ____ years experience as a programmer

I have ____ years experience in Operations

I have ____ years experience in MIS applications

I have ____ years experience in telecommunications software ☐ hardware ☐

I have ____ years experience in systems support

I have ____ years experience in other (please specify)_____

My resume and salary history are attached.

SALES and SUPPORT OPPORTUNITIES

SALES PROFESSIONALS (7)

SYSTEMS ENGINEERS (3)

Technetronic Inc.

Equal Opportunity Employer M F H

SAUDI ARABIA

ABWA Corporation, a Data Processing Facilities Management Contractor offers opportunities to qualified professionals for positions in Riyadh Saudi Arabia.

ABWA needs highly qualified and motivated personnel, knowledgeable with the DOS/VSE environment, and experienced in teleprocessing and Database Management using such products as CICS/VS and ADABAS/NATURAL.

ABWA offers an excellent compensation package that includes housing, car, medical care, insurance, schooling for children, eight weeks vacation and air fare.

The following positions are offered:

SENIOR SYSTEMS ANALYST

This position requires a degree in Computer Science or equivalent and 6-10 years practical experience in all phases of systems analysis from initial contact through design and implementation. Emphasis is placed on the thorough knowledge and practical experience in structured methodologies, teleprocessing and database techniques. Organizational skills and the ability to manage small project teams essential.

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This is a senior position for Operating Software Maintenance and requires a degree in Computer Science with at least three years experience in DOS/VS and CICS/VS internals. The prime responsibility consists of maintaining a 70 plus terminal.

Network utilizing CICS/VS, operating under ACF/VTAM with NCP, NPDA, and NCCF. Proven ability in Assembler and System Tuning a must, experience in ADABAS, ICCF, STAIRS or ATMS III desirable.

SENIOR PROGRAMMER

Requires a degree in Computer Science or equivalent work experience in Business Application Systems. Technical requirements include experience in teleprocessing and database, preferably CICS/VS and ADABAS. Position requires practical experience in structured methodologies and ability to assume responsibilities such as minor analysis, design and documentation. The ability to organize personal workload and work independently required.

COMPUTER OPERATORS

Position requires a minimum of two years experience in a DOS/VSE, CICS/VS operating environment supporting a large scale teleprocessing network. Responsible persons are required to rotate on a 2 shift basis.

USER TRAINERS

Position requires a degree as well as past experience in teaching or training and a minimum of three years experience in either programming, analysis or computer operations. Fluency in Arabic and English, both written and oral an absolute must. Responsibility will include training users in the use of Application Systems and providing liaison between users and the systems development group. Some limited travel to various locations within the Kingdom is required.

If you wish to be considered for a position with ABWA Corporation please send your resume indicating the position for which you are applying along with salary history to:

ABWA CORPORATION
P.O. Box 1633
Riyadh, Saudi Arabia 11441
Attn: Project Director

PROGRAMMER/ PROGRAMMER ANALYSTS

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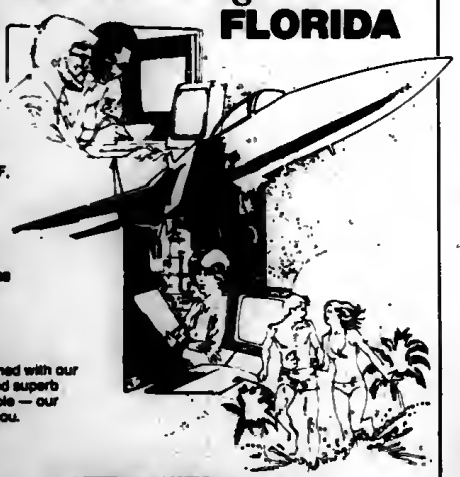

PRATT & WHITNEY is seeking individuals with a Degree in Computer Science or related area and 2-5 years experience with COBOL, IBM JCL, MVS, TSO, SPF, IMS DB/DC on large IBM main frames in the following areas:

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Please send your resume to Professional Placement, P.O. Box 2691, West Palm Beach, FL 33402.

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Senior Systems Programmer/Analyst

Join the Corporate Data Processing staff at National Health Laboratories in Dallas, TX. Design, program, and install on-line data systems nationwide, utilizing Digital Equipment Computers. Require college degree, preferably in Computer Science and 3 years experience. Desire mini-computer experience. Send resume to:

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Sys. Prog. (3 yrs MVS or IMS)	to $40,000 SC location
Sys. Prog. (3 yrs NCP & VTAM)	to $40,000 FL location
Sys. Anal. (3 yrs Ins. appl. & COBOL)	to $28,000 TN location

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Sr Software Engr's (Unix-DEC or INTEL)	to $55,000
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ILLINOIS STATE UNIVERSITY

Applications are invited for the position of Chairperson of the Department of Applied Computer Science at Illinois State University. The Chairperson has administrative responsibilities for leadership in defining goals, planning, and budgeting. Teaching load is one class per semester. The Department has 21 full-time faculty and [illegible] majors. The program is non-traditional, applications-oriented and follows the DPMA model curriculum. The Department is [illegible] recognized and has grown [illegible]. Facilities include large [illegible] compatible mainframe with 100 terminals, microcomputer laboratory with PC's and Apples, and network connections to CYBER. Applicants should have an earned doctorate in Computer Science/Information Systems or related field and should have a proven record of research, publishing and scholarly accomplishments. Salary is commensurate with qualifications and experience. Position available July 1, 1984. Applications will be accepted until April 16, 1984, or until position is filled. Applicants will send a complete resume with four references to:

Chairperson
ACS Search Committee
College of Applied Science and Technology
Turner Hall Room 140
Illinois State University
Normal, IL 61761
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300 DP Openings

[illegible]

#1 employment agency, #1 DP employment consultant for 1982 in IPA (120 agencies, 300 consultants), now #1 agency in NPC (100 agencies, 400 consultants). Fee paid.

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Tenure-Track position beginning August 1984. Assistant or associate professor to assume chair duties of established program in liberal arts college using DEC 11/44, and PRIME 750. Also Vectrix Graphics Processor. Must be able to teach upper-level courses including Data Structures, Operating Systems, and Computer Design. Ph.D. desired in CS or related field. Masters in computer science required. Teaching experience preferred. Nine-month contract with summer teaching possible under separate contract. Salary competitive in computer science field. Good fringes. Apply to:

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An elegant approach led to a very elegant solution — National's NS16000 microprocessor and its product family. The revolutionary top-down architecture delivers 32-bit power, and memory management capabilities on par with the latest mainframes. The upward-compatibility will accommodate a shift from 16- to 32-bit hardware. In essence, the NS16000 performs more like a computer than a chip, and we think that's a very elegant package.

A "Software-Intensive" Effort.

The NS16000 microprocessor is the spring-board for an entire family of products currently being developed at National's Microprocessor Systems Division. The key to their success lies in the development of software that enhances the NS16000 family's performance, applicability, and elegance. From development through marketing, our "software-intensive" effort is rapidly gaining momentum as we develop demand-paged UNIX® systems based on Berkeley 4.1bsd and 4.2bsd for National's NS16032 and NS32032 microprocessors. We are also working with Bell Labs to define a version of SYSTEM V, . . . ,etc., for NS16032 and NS32032. These developments are creating opportunities for software professionals with UNIX and IBM PC® experience to join us in the following areas:

Sr. Software Engineers: Compiler Development

You will be involved in developing compiler code optimizers for "C", Pascal, FORTRAN, etc., to take advantage of the NS16000 elegant architecture. Your background should include two to five years' experience in compiler development; UNIX experience is desirable.

Sr. Software Engineers: Language Tools Development

You will be involved with developing assembler, linker, or debugger. Requirements include two to five years of language tools development experience, including knowledge of "C", Pascal, FORTRAN, and UNIX.

Sr. Software Engineers: UNIX System Architect

You will be involved in defining the future UNIX system products for NS16032 and NS32032. Two to five years' experience in UNIX kernel and system development is desired.

Sr. Software Engineers: UNIX Kernel Development

You will work on porting Berkeley 4.2bsd to NS16032 and NS32032 based microcomputer systems (including a popular PC configuration with NS16032 and NS32032 add on boards). Two to five years' experience in UNIX kernel development is desired.

Sr. Software Engineers: Networking

You will work with developing/porting networking software under Berkeley 4.2bsd on NS16032 and NS32032 based microcomputer systems. Two to five years' experience in networking protocol design and development is desirable.

The Rewards Of Elegance.

The elegance and power of the NS16000 will become evident as more software is developed for it. And those who develop that software will reap the rewards, personally and professionally. That's definitely something to think about if you're ready to take on the challenge of our opportunities.

To learn more about National's Microprocessor Systems Division, send your resume to National Semiconductor, Dept. MS, P.O. Box 62489, Sunnyvale, CA 94088. We are an equal opportunity affirmative action employer. Principals only please.

NS16000
Elegance is everything.

talk about your

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[illegible]

TECHNICAL SUPPORT PROJECT LEADER

to directly manage a staff responsible for administering to an ACP computer system's stability, reliability & integrity. Will support, maintain & develop ACP systems software on-site programming & data base management to achieve max. system availability & user confidence. Requires 4-6 years' ACP system internals experience.

STAFF TECHNICAL ANALYST

Responsible for the development, implementation & maintenance of the ACP system, its components & sub-systems. Critical experience requirements are in-depth knowledge of complex hardware systems configurations & related software components. Indirect management of 6-person staff.

TECHNICAL SUPPORT ANALYST

To insure the integrity & availability of the ACP computer system by performing problem resolution activities & assigned maintenance functions. Must possess strong understanding of IBM systems 370 Assembler language to perform software changes and for problem determination of ACP system faults.

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COMMUNICATIONS SOFTWARE PROFESSIONALS

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During 1984 we're planning significant expansion for our Software Communications organization. They will be responsible for advancing the state-of-the-art in areas including Networking, Telecommunications, Distributed Operating Systems and IBM Interface. In Local Area Networking we're using PRIMENET, ETHERNET, IEEE 802 and IBM Token Ring. In Packet Switch or Packet Data Networks we're working with TELENET ©, TYMNET, DATA PAC © and UNINET. As we continue to introduce new software communications products to the marketplace we will also be expanding our Marketing Support and Customer Service organizations as noted below.

Specific openings exist in the following areas:

RESEARCH AND DEVELOPMENT

Senior Technical Consultant

This individual will be responsible for leading the architecture and design of new networking products in Communications Software Engineering. Specific areas of experience should include protocol design in OSI layers 3 and above as well as network management. Previous involvement with national or international networking standards organizations would be a consideration as the technical direction of PRIME networking is closely aligned with those efforts.

Software Engineer

Individual will be involved in design coding and testing of new network terminal subsystem in PRIMENET development section. Specific areas of responsibility will include security-related mechanisms for access control, usage accounting, etc., and dynamic operational control interfaces. Previous development experience with networking, terminal subsystems or Primos is required.

Senior Software Engineer

Several openings exist for engineers to develop test beds for the testing of new communications products. Prior experience with SNA, X.25, 3270 BISYNC or software for microprocessor based controllers is a plus.

Senior Software Engineer

An excellent opportunity for an IBM systems programmer to move from data processing to software development. Requires prior experience with VTAM or CICS and knowledge of SNA.

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Use your knowledge of 3270 BISYNC or other synchronous communications for our product development. Experience in high level languages, especially PL1 is a plus.

Senior Software Engineer

Opportunity for engineer experienced with X.25 protocol to do network product development. Experience with X.28 PAD implementation would be desirable.

For the above positions, please send resumes to Dale Welsh

MARKETING SUPPORT

SNA Product Support Specialist

As a senior systems specialist with a heavy SNA background and strong managerial skills, you will be responsible for leading the SNA product introduction from a technical standpoint which will include presentations, network designs, benchmarks, and controlled release worldwide.

Extensive customer and senior management interface requiring excellent verbal and writing communications skills.

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Responsible for high level technical support to our world-wide customer base. At least 2 to 5 years communications support or programming with experience in X.25 standard, LAN, IBM 3270 protocol and IBM SNA, Remote Job Entry (RJE), FORTRAN, PL/1. BSCS or related degree and strong oral and written communications skills.

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Now, CCA has opened a major new branch in **Denver**, including a Western Region Education Center and a Research and Systems Group. Our expansion creates exciting **ground floor opportunities** for Database Consultants, Software Analysts, Programmer/Analysts, Computer Scientists, and Project Managers.

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Computer scientists with experience in database management systems are needed to apply advanced data management technology to a variety of projects. Knowledge of database machines, database security, network communications and query languages desired. Experience with large DoD projects a plus. Requires an advanced degree in Computer Science.

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Large Applications Systems

We have a variety of challenging opportunities for Database Consultants, Systems Analysts and Programmer/Analysts to support the design, development and implementation of large, complex applications systems utilizing **MODEL 204**. Duties include advising customers on the application of advanced data management techniques including database design, data dictionaries and distributed data management. Experience with a commercial DBMS in a large IBM environment required; background including large DoD projects highly desirable.

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A Project Manager, Lead Systems Analyst and several Systems Analysts/Programmers are needed to design, develop and implement a production distributed database capability for an interactive IBM environment with **MODEL 204**. Experience in the design and development of large software systems in an IBM environment is required. Training in DBMS technology and experience using a commercial DBMS is essential. Knowledge of IBM system internals, VTAM, and SNA a plus. BS/MS in Computer Science is preferred.

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In addition, the new Survey details seven ways to maximize your chances of getting ahead through a proven, seven-step system that has helped thousands of computer professionals advance their careers.

Free to computer professionals.

The new 32-page Survey is available to you without charge. Since 1966, this annual report has helped approximately a quarter of a million computer professionals understand current trends in technology and compensation, realize how and where they fit in and what they need to do to reach their full potential.

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SOFTWARE - MVS-SP1, ACF VTAM, NCP, TSO/SPF, CICS, VS/COBOL, VS/FORTRAN, RACF

IBM VM SYSTEM SOFTWARE SPECIALIST

Position requires a minimum of one to two years experience in installation and maintenance of VM/SP and related products including RSCS, APL, ADRS, GDDM, PROFS and ISPF. Assembly Language coding is desirable and knowledge of SSX/VSE or other guests systems running under VM would be a plus. Experience is not required in all areas:

HARDWARE - IBM 43 XX, 3370, 3274, 8670
SOFTWARE - VM/SP, APL, GDDM, PROFS, ISPF, SSX/VSE

IBM IMS/VS SYSTEMS PROGRAMMER

Position requires experience as an IMS applications programmer using COBOL plus two years experience as an IMS/VS system programmer with proficiency in the following areas: Installation, SYSGEN, Maintenance, Problem Determination, Debugging, Performance Measurement and Tuning, OS JCL, SMP/4.

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SOFTWARE - MVS/SP, IMS/VS, DL/1 ADF, VS/COBOL

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You will analyze through the use of sophisticated state-of-the-art, computer-based models and other operations research methods, broad and complex division problems and projects utilizing voice, video, data and text technologies. You will also provide Senior Management with recommendations of solutions and best alternatives; and provide a broad base of consulting capabilities to the division. A Bachelor's degree or equivalent is required in Math, Operations Research or Computer Science and six years experience in a quantitative field with at least four years experience in operations research. A Master's degree in Operations Research or Computer Science is preferred.

SYSTEMS DEVELOPMENT GROUP

SENIOR SYSTEMS DESIGNER

You will design and transform user requirements and provide technical advice and expertise to Line Haul Operation management on all aspects of user application systems, as well as state-of-the-art information of related industry data processing application systems. Six years experience in Data Processing with at least four years experience in systems development is required. A Bachelor's degree is Computer Science, Math, Engineering, or Business, and complex systems experience is IBM/Wang systems is preferred. Previous experience with airline business applications systems in a maintenance and engineering environment would receive preferential consideration.

SENIOR PROGRAMMER/ANALYST

You will design and transform user requirements into an application program for information systems, work on highly complex projects and provide technical leadership for user personnel for automated processing. Position requires five years programming experience including working knowledge of FORTRAN and COBOL and a Bachelor's degree in Computer Science, Math or Engineering is preferred. Previous experience with airline business applications systems in a maintenance and engineering environment is preferred along with experience on IBM/Wang systems. You must also have ability to communicate technical information to user.

Both positions require experience in FORTRAN, SAS, PL1, EMPIRE, and TELL-A-GRAF.

SYSTEMS OPERATIONS GROUP

SR. SYSTEMS MAINTENANCE COORDINATOR

You will maintain, enhance, document and implement existing application software. Five years experience in systems development, maintenance and enhancement is required. A Bachelor's degree in Computer Science, Math or Engineering and previous experience with airline business applications systems is a maintenance and engineering environment is preferred.

PROGRAMMER/ANALYST

You will design and transform user requirements, maintenance and enhancements to our application program for information systems, work on highly complex projects and provide technical leadership for user personnel for automated processing. Three years programming experience including working knowledge of FORTRAN and COBOL is required. A Bachelor's degree in Computer Science, Math or Engineering and previous experience with airline business applications systems in a maintenance and engineering environment is preferred. Must be able to communicate technical information to user.

COMPUTER OPERATIONS TECHNICIAN

You will maintain and operate computer equipment and provide technical assistance to users within the Line Haul Operations Division on IBM and Wang equipment. Three years experience in Data Communication networking or computer operations is required along with experience in system design and technical knowledge of computerized system analysis. An Associate's degree in Computer Operations is preferred.

SYSTEM ENGINEERING GROUP

PROJECT MANAGER-PROGRAM ENGINEERING

You will plan, organize, direct and control the engineering and testing of sophisticated software, hardware, and communication networks within Line Haul Operations to ensure compliance with corporate strategies for voice, video, data and text systems.

A Bachelor's degree or equivalent is Computer Science, Math or Engineering, and six years data processing experience with three years in hardware, software and communications engineering is required. Data base, testing, and data protection experience is preferred.

ENGINEER/SENIOR ENGINEER

You will perform the design testing activities relevant to hardware, software and communication implementation for Line Operations. A Bachelor's degree or equivalent in Computer Science, Math or Engineering is required. Two years experience in systems hardware/software support is necessary for the position of Engineer and four years experience in systems hardware/software and communications is required for the position of Senior Engineer for voice, video, data and text.

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You will be responsible for developing, maintaining and editing all existing Line Haul Operations developed data bases and ensure protection for the Systems. Three years programming experience with one year in Data Base Protection is required. Knowledge of M&E data processing techniques is desirable. We prefer you have a Bachelor's degree in Computer Science, Math or Engineering.

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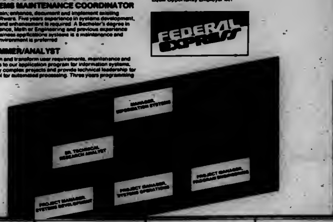

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You will provide the engineering support necessary to successfully integrate and install major communication systems. Individual has opportunity to provide pre- and post-sales engineering support, and design and support customer specials (RFQs). Individual will primarily work in conjunction with a project engineer. Minimum of 3 years experience in the telecommunications/data communications environment. BS in Engineering/Computer Science or equivalent in years of experience. Knowledge of protocols, exposure to datacomm applications, field service or application engineering experience a plus, but not necessary.
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You will work with Codex professionals in the development and enhancement of communications software for network processors. Specific duties include coding programs and tools in "C" and Assembler languages, performance benchmarking and analysis of UNIX™ operating systems and working with users to ensure the optimum performance of internal communications software. To qualify, you must have a BSCS or its equivalent, plus at least 7 years of programming experience utilizing a high level language (e.g. PASCAL). An in-depth knowledge of UNIX™, "C" Language, and proper coding and documentation techniques is essential.
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Please forward your resume to CODEX CORPORATION, Dept. 200-227, P.O. Box 307, Canton, MA 02021, to the attention of the appropriate individual.

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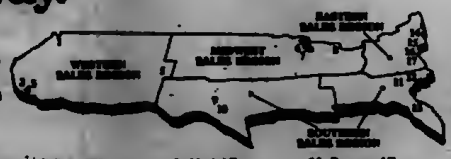

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These positions are responsible for selling HP's technical computer products to scientific, technical and manufacturing customers in your assigned territory. Besides degree or equivalent, 2 years' successful CAE/CAD/CAM or manufacturing minicomputer sales experience is desirable.

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These positions are responsible for selling large-scale minicomputers, primarily to the manufacturing market. As well as managing the existing customer base in your assigned territory. Besides degree or equivalent, 2 years' successful business computer sales experience is desirable.

Invest in your future... long term.

We rank high among major computer companies in terms of sales growth, earnings, product innovations and employee retention. This means career stability... year in and year out. It starts with in-depth training for up to 10 months, covering every aspect of the business... from learning the HP product line in the most sophisticated sales techniques. You'll quickly gain hands-on experience working with senior HP people.

With HP you'll reap the benefit of rapid production, delivery and installation, plus strong pre-and post-sale technical support. Because our credo is "productivity - not pressure."

Consider the HP advantages.

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Eastern Region
Murray Kaplan
HP Dept. CW
4 Choke Cherry Rd.
Rockville, MD 20850

Midwest Region
Barbara Meyer
HP Dept. CW
5201 Tollview Drive
Rolling Meadows, IL 60008

Southern Region
Karl Paul
HP Dept. CW
2000 South Park Place
Atlanta, GA 30339

Susan Benson
HP Dept. CW
930 E. Campbell Road
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Blair Farr
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Dartmouth College

DATA PROCESSING PROFESSIONALS
THE FUTURE IS HERE TODAY

ERLANGER MEDICAL CENTER, located in historic Chattanooga, TN, is beginning the second phase of its long range data processing plan. Several growth opportunities are available for dedicated Data Processing Professionals interested in the professional challenge of implementing state of the art on-line, data base systems utilizing COBOL programming and transaction processing technology. Our newly constructed Data Center includes dual 12 MIPS Burroughs B7900's, minicomputers, microcomputers, and office automation systems. We offer the opportunity to expand your technical and professional skills in a progressive health care setting.

OUR REQUIREMENTS are for individuals with 2 to 4 yrs. experience on medium to large scale batch and on-line systems. We seek above average skills in communication, organization, sensitivity to end user needs and a stable employment history. Burroughs and Health Care backgrounds are a plus.

APPLICATIONS DEVELOPMENT MANAGER - This is a fast track management position requiring you to carry out concurrent implementation of several vendor packages. You will need a strong project management background and be skilled at developing detailed project definition and budgets. Responsibilities will include the supervision of approximately 12 analyst and programming personnel. You will provide both technical expertise and functional specifications for data base and batch processing applications in a COBOL environment and be responsible for timely completion of assigned projects. Heavy user contact is required for developing user requirements, documentation and in establishing technical and user training.

SYSTEMS ANALYST - You will serve as liaison between users and the Data Systems Dept. Responsibilities include specification, design and installation of financial and patient care systems. You will oversee analyst programmers in projects through implementation. Four yrs. experience as a system analyst with hands on implementation experience with custom and application packages involving data base and data communications and the ability to handle multiple projects. A Bachelor's degree and programming background are desirable.

ANALYST PROGRAMMER - Assignments include detailed program design, coding, testing and debugging as well as documentation and implementation of batch and on-line systems. You will assist in systems specifications, design tasks, and end user training. At least 2 yrs. of heavy experience in COBOL program design, coding, and testing. Familiarity with Assembler language programming, micro and mini computers a plus.

COMPUTER OPERATIONS SUPERVISOR - Your responsibilities will be to cover our dual B7900 computer processing activities on your shift. This will involve assuring effective data control, personnel and work scheduling, developing and maintaining standards and procedures, operator run instructions, and other related duties. A minimum of 4 years of operations experience is required, 2 of which must have been in a supervisory roll.

YOUR FUTURE will hold outstanding technical opportunities and challenges. In addition to a mild four season climate, the warm hospitality and historic traditions of the South, you'll find a comprehensive benefits package that recognizes your individual achievement and performance. Tennessee has no state tax and ranks among the lowest in overall cost of living.

IF YOU'RE READY for the challenge, send your resume to:

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CHATTANOOGA, TN 37403

Systems Professionals

Burroughs Corporation's System Engineering Division works with selected large domestic and international accounts to solve challenging customer problems in the areas of distributed systems, networking and real-time transaction processing. We're looking for take-charge professionals to get involved in current activities such as Requirements Identification, Network and Systems Design, Modeling, and Performance Analysis.

We require in-depth knowledge in at least 2 of the following areas:

- ***DMS II***
- ***BNA***
- ***NDL/NDL II***
- ***MCP***
- ***GEMCOS/TPS***
- ***SMF II***

with at least 5 years' experience in systems support or systems design with medium or large systems. Specific expertise in Performance Management, Capacity Planning and Network Design is highly desirable.

Burroughs offers the chance to take your talent to the limit of professional creativity and growth in a supportive environment, as well as an excellent salary and benefits package combined with the low-cost-of-living and cultural amenities of the Philadelphia area. For confidential consideration, call ***(215) 964-5867****, or send your resume to:*

Diane McGonigle
Burroughs Corporation
System Engineering Division
240 Radnor-Chester Road
Radnor, PA 19087
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Burroughs

SENIOR SYSTEMS ANALYST

Abbott Laboratories is a $2.9 billion, rapidly growing leader in the expanding medical care products field. The sophisticated technical environment at our new facility in Austin, Texas, combined with our continued growth, has created an exceptional opportunity for an experienced Senior Systems Analyst.

Under the direction of the Data Processing Manager, this position will be responsible for long-range systems planning and the design/implementation of manufacturing and business systems. Ideal candidates will have a B.S. in business or a related degree, with an emphasis in computer science. 8-10 years of programming and systems analysis and design experience as a project leader on manufacturing data collection systems is required. Design experience using System 38 is also required. Knowledge of Series 1 and RPG III is desired.

Abbott provides excellent potential for career development and an attractive wage and benefits package that includes profit sharing and stock retirement plan. For consideration, send resume with salary history, in confidence to: Marsha Gardner/Personnel Representative.

ABBOTT
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MANAGER OF DATA PROCESSING

A Fortune 500 company based in the Los Angeles area is looking for a Manager of Data Processing. This is a senior position, reporting directly to a member of the executive board. The successful candidate will be responsible for one of the largest Data Processing systems in southern California and for both the operating and applications programming aspects of the installation in support of a high technology R&D and manufacturing organization.

To qualify, one must have at least 5 years experience in a senior management position and have demonstrated familiarity with both the business and practical applications of electronic data processing and computer systems. A B.S. in a technical discipline or Business is required. An advanced degree is preferred.

For prompt and confidential consideration, please forward your resume to:

CW-84867
Computerworld
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U.S. Citizenship Required

TECHNICAL SUPPORT PERSONNEL

Kennametal Inc., a world leader in the development of hard carbide metals and advanced tooling systems, has several openings in its technical support group. These positions, located at the corporate headquarters facility in Latrobe, Pa., would provide central support for the multi-CPU data center in Latrobe and to remote single-CPU data centers.

SENIOR SOFTWARE SPECIALIST FOR CICS

Three to five years' experience in CICS installation, maintenance, troubleshooting, tuning, and interfacing with IBM support center, and at least two years in an MVS environment are required. Knowledge of IMS/DB, DMS and UFO is desired. Experience with MRO and ISC is helpful.

SOFTWARE SPECIALIST FOR CICS

One to three years' experience in CICS table maintenance and problem resolution with one year in an MVS environment are required. Experience with IMS/DB, DMS, UFO, MRO and/or ISC is an advantage.

SOFTWARE SPECIALIST FOR VM/MVS

Two to four years' experience in system generation, maintenance, problem resolution and product installation in a VM and/or MVS JES2 environment are required. Experience with NJE and VSAM is desired. Information system and/or UCC1 experience is a plus.

Situated in the heart of the recreationally rich Laurel Highlands, Latrobe is only an hour away from the culture, commerce and excitement of Pittsburgh. If you have the qualifications, please submit your resume and salary requirements in confidence to:

Kennametal Inc.
Attn: Robert Kendra
P.O. Box 231
KENNAMETAL® Latrobe, PA 15650

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PROGRAMMER ANALYST

Needed for small college administrative computing center. Short to batch development, implementation and maintenance of software systems. 3-5 years RPG II programming with systems analysis experience. Requires experience on IBM System/34 or 38 CCU and utilities, including WSU. Good knowledge of BASIC and microcomputers. BA or BS in Data Processing or related field desirable. Accounting or business background a plus. Salary commensurate with experience. Competitive benefit package. Send resume with current salary by April 1, 1984 to: Data Processing Manager, Maine Maritime Academy, Castine, ME 04420. An Equal Opportunity Employer.

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CLASSIFIEDS

DIRECTOR DATA PROCESSING
SALARY $34,152-$43,680

The Child Support Enforcement Unit of the Office of the Attorney General of Texas has an immediate opening for Director of Data Processing. The position requires a bachelor's degree in CS or related field and 7 years of successful professional experience in data processing, including 5 years in supervisory and management positions. Desirable knowledge includes systems analysis and design, software tailoring, on-line network control, computer operations, and production coordination. Some experience with different hardware brands and hardware procurement is also desirable. Some knowledge of CICS will initially be helpful. DUTIES: Supervise programming, operations, and production staff; assist in the evaluation of data processing needs, the procurement of required hardware, and the procurement or development of required software; coordinate division activities with other divisions in the AG's office and with DP divisions in other government agencies. Send detailed resume to Office of the Attorney General, Personnel Division, P.O. Box 12548, Austin, Texas 78711 by 5pm on March 9th.

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In an academic environment. Position available for Manager of User Services in rapidly growing university computer center with a staff of over 20 student consultants and permanent programming staff, the individual selected for the position will manage computer consultant services for almost 300 faculty members as well as students who are enrolled in Computer and computer related courses. Working knowledge of statistical software packages such as SPSS, BMDP, SAS, and IMSL is required. A Master's degree or equivalent experience in computer science, statistics or a related discipline is required. Ability to communicate well orally and in writing is mandatory. Annual salary range: $25,974 - $31,038. Submit cover letter and resume by March 9, 1984 to:

Personnel Office
George Mason University
4400 University Drive
Fairfax, VA 22030

AA/EOE

MISSISSIPPI STATE UNIVERSITY is seeking Programmer/Analysts for Administrative Data Processing. BS Degree and DMS 1100 experience required. Send resume to:

Gerald Matthews, Director
Computer Center
and Services
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Lisle, IL 60532
(312) 964-9248

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TYMSHARE, INC.
6333 Harry Hines Blvd.
Dallas, TX 75235
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THREE LOCATIONS
Right now we have openings in three locations: Charlottesville, VA, Norfolk/Virginia Beach, VA and the Washington, D.C. metro area. Positions require a minimum of 1-5 years' experience in the following areas:

SYSTEMS PROGRAMMERS (Norfolk/Virginia Beach and Metro Washington, D.C.). Strong knowledge of operating systems internals in either an MVS or VM environment.

APPLICATIONS PROGRAMMERS (Charlottesville). Data base experience (Model 204 preferred). FORTRAN or COBOL and modeling background.

TASK LEADERS (Metro Washington, D.C.). Experience in any of the following: UNIX, ETHERNET, XNS, and ADABAS.

For immediate consideration, please send your resume to: Jim Aquino, Planning Research Corporation, 1500 Planning Research Drive, Dept. JA-31, McLean, VA 22102. An Equal Opportunity Employer M/F/H/V. Principals Only.

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Are you ready to take another step forward in your career—making the most of your DBMS talents and skills? Do you desire involvement implementing current data base technology, and ADP systems design, development and programming? Then consider a positive career move to Computer Data Systems, Inc.. As a rapidly growing data processing company with well over 1600 employees, we realize that our success is a direct result of our staff's commitment to excellence.

Qualified candidates should have 5-7 years of data processing experience which includes 3-4 years of IBM COBOL as well as 1-3 years work experience with ADABAS/NATURAL.

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Computer Data Systems, Inc., Suite [illegible], Dept. [illegible], 7315 Wisconsin Avenue Bethesda, Md. [illegible].

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ST. ANDREWS PRESBYTERIAN COLLEGE
Director of Computer and Information Services

Located in Laurinburg, North Carolina, St. Andrews Presbyterian College is a four-year, liberal arts, coeducational, residential college with an enrollment of approximately 750 students.

DESCRIPTION OF POSITION:
The College is in the process of upgrading its computer center both in terms of hardware and software. As such, the college is seeking a highly qualified individual to direct the implementation of this upgrade.

The director will supervise the computer center manager and programmer as well as have responsibility for a staff of work-study students. The director's major responsibilities will include, but are not limited to, the following:
(1) development and implementation of user education program for administrative users; (2) oversee the day-to-day operation of the computer center; (3) long-range planning of the college's computer needs; (4) budgetary control of the computer center.

EQUIPMENT AND SOFTWARE:
Current equipment consists of one PDP11/[illegible] system and one recently installed PDP11/44. Existing plans call for the PDP11/[illegible] to be converted to a PDP11/44. One system is expected to serve [illegible] terminals for student instruction and the other system will serve administrative needs. The college, through the assistance of a consultant, is in the process of selecting administrative software.

QUALIFICATIONS:
Candidate should hold a graduate degree, to have a minimum experience of three years in a similar position. Candidate should be experienced in the operation of the PDP11 family of computers and RSTS/E operating systems.

SALARY:
Salary will be very competitive and commensurate with qualifications.
Send letter of application, resume and letters of recommendation by March 15, 1984 to:

Jerry [illegible], Business Manager
St. Andrews Presbyterian College
Laurinburg, North Carolina [illegible]

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Acquire one of the most demanded & rewarding programming skills in months instead of [illegible] years. A complete & practical guide to CICS Command Level Programming. It's based on CICS latest release 1.6, written in COBOL, with special emphasis on VSAM. Brand-new 2nd edition, contents printed in two colors, handsome mylar-coating cover. 150 examples illustrate use of CICS commands. [illegible] sample CICS programs address all major applications. Sample programs include: Menu, Add, Update, Delete, Browse, Multi-record display/update, Print 24x80 [illegible] any-size report, Message Routing, Screen Refreshing, VSAM alternate index design, setup and handling, Dynamic table manipulation, Auto Task Initiation and more.

[illegible] time saving—and more

It's hard to believe the learning can be so easy until you try it. In hours you can start creating BMS maps. In days, you can start writing Pseudo Conversational CICS programs. You'll cut your learning curve at least in half; many programmers report even greater saving. Some CICS techniques are especially hard. When you're stuck for the technical problems, you'll be thankful you have this book. All CICS techniques and problem areas are thoroughly covered. You'll find the topics on Production abend handling, Test system debugging, Dump reading, Trace table usage, CEDF monitor, CSMT, CEMT commands, CICS internal tables setup & effects on application programs, Terminal Paging commands, complete procedures to install a CICS transaction and more. Why spend hours searching for the right technique — when this book gives them to you already written.

Tips on moonlighting on CICS projects

Consulting will be the trend of the 80's for CICS due to great shortage of experienced CICS programmers. An average CICS contract programmer makes $30-$45/hr. Some CICS consultants even make $1000/day ([illegible] Datamation). Moonlighting on CICS projects is very rewarding. A typical 10-screen system can mean $15,000-$25,000 cash. This book contains 11 pages of tips on moonlighting like: how to market your service, locate the contracts, write a proposal, make a presentation, quote the right price to beat consulting firms and draw a contract agreement without a lawyer. Written proposal & sample contract agreement are included for your convenience.

Try this book at no risk

How much is this book worth to you? It's hard to say until you try it. That's why we want you to use it for 10 days. If you're not completely satisfied, simply return it at our expense for a prompt full refund. Fair enough! Thousands of copies have been sold. Over 99% of programmers who bought this book are satisfied with it. See how much time it saves you. How it leads you to the gold mine of programming. That's how sure we are that once you use it, nothing could make you part with it. This book will pay for itself over and over, year after year. But act now. Send $34.95 for 1, $29.95 ea for 2, $27.95 ea for 3, $25.95 ea for 4 & over (plus $2.00/copy for P&H) in check or M.O. to: CCD Online Systems, PO Box [illegible], Dallas, TX 75379. Allow 1 to 2 weeks for delivery.

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The heavily experienced professional we seek will supervise development and implementation of Applied Mathematics/Scientific Programming and Business Systems. You'll also propose and manage projects in support of an engineering staff. A PhD in Applied Mathematics is preferred, with at least 10 years experience, including some supervisory background. Excellent oral and written communications skills are required.

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In these diverse positions, you'll be involved with evaluation, implementation and support of office automation equipment. You'll also have the opportunity to develop your expertise in supporting VAX Systems Software. You should have at least 5-8 years of related background including personal computer evaluation and applications, and word processing on PDP-11 or VAX equipment. Excellent oral and written communications skills are required as is a BS/BA in Math, Computer Science or a related discipline.

VAX SYSTEMS ENGINEERS

If you are a Fortran Senior Systems Programmer with VAX VMS background, these positions offer you the opportunity to enhance your digital communications skills. Your at least 5-8 years of experience should include hardware/software configuration. You will have the opportunity to develop voice communications expertise. A degree in Math, Computer Science or EE is required.

Salary and benefits are excellent as is the potential for career development. For confidential consideration, please send your resume to: Roseann Taylor, Division Personnel Manager, ALLIANCE RESEARCH CENTER, Babcock & Wilcox, Research & Development Division, 1562 Beeson Street, Alliance, Ohio 44601. An Equal Opportunity Employer M/F/H/V.

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COMPUTER SYSTEMS ENGINEERS

The Upjohn Company, a leading pharmaceutical company with headquarters in Kalamazoo, MI, has two highly challenging opportunities for Computer Systems Engineers.

The first position requires a Bachelor of Science degree in Electrical Engineering, Physics, Computer Science or a related field, and a minimum of four years recent experience in the design and implementation of data acquisition projects. Good interpersonal and communication skills are essential. Knowledge and use of analytical instrumentation found in the pharmaceutical business is desirable.

Duties will include systems design, electronic device development, software design, and implementation of laboratory automation systems used for data acquisition.

The second position requires a Bachelor of Science degree in Computer Science with a heavy content of computer logic programming, plus two years' experience as a systems programmer. VM CP and CMS system knowledge and experience are required, along with a thorough working knowledge of the 370 Assembler language. VM related program product and PL/1 language experience is desired.

You'll assist or perform VM CP and CMS operating systems generation and maintenance for multiple large scale processor configuration, install and support various program products which run under CMS, participate in software and hardware planning and user consultation where advanced operating system or program product knowledge is required.

In both positions, you'll become active members of a small team of professional designers in the challenging computer systems engineering field. Your varied assignments will involve both hardware and software solutions to unique problems found in this field.

Kalamazoo is a mid-sized southwestern Michigan community offering a mix of cultural/recreational opportunities that include lakes, nearby colleges, and a four-season climate. In addition, The Upjohn Company offers a competitive salary, and benefits that include generous relocation assistance.

For confidential consideration, please call from outside of Michigan toll free 1-800-253-8600 and ask for extension 3-8787; or call from Michigan collect 616-323-8787 to request that a specialized employment application be sent to you immediately. Please refer to ad number 15812-E when calling.

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You will be working in small teams to develop short intensive courses aimed at upgrading the skills of executives, users, I/S managers and I/S professionals from organizations in Singapore and South East Asia. You will also participate in teaching a post-graduate Diploma course in Systems Analysis. In addition, you will have opportunities to engage in consultancy and applied research.

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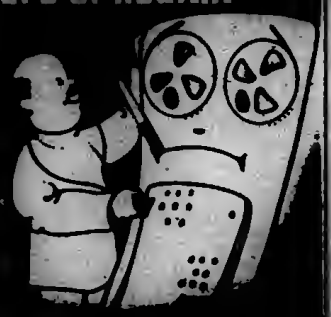

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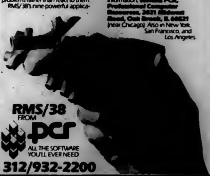

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Japan: Mr. Shuji Mizuguchi, Computerworld Japan, 7-4 Shintomi 1-Chome, Chuo-ku, Tokyo 104. Phone: (03) 551-3882, Telex: 252-4217 (Computerworld Japan only).

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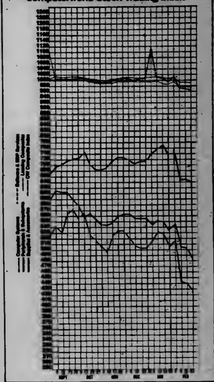

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CLOSING PRICES WEDNESDAY, FEBRUARY 22, 1984

COMPUTER SYSTEMS

[illegible]

LEASING COMPANIES

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COMPONENTS

[illegible]

SOFTWARE & EDP SERVICES

[illegible]

PERIPHERALS & SUBSYSTEMS

[illegible]

SUPPLIES & ACCESSORIES

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Staying ahead is easier for a company that's steeped in software technology. MSA has spent years developing, refining, testing and enhancing our systems.

This year alone, we'll invest $25 million to make sure all our systems are technologically razor sharp. That gives us a decided advantage over flash-in-the-pan technology that may not have the bug-free logic of a more experienced system.

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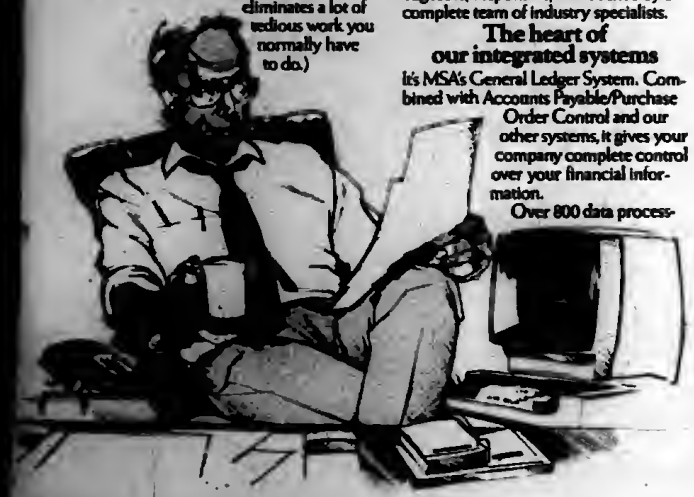

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1. Can you offer us a complete range of software systems designed to work together?
Or will we have to piece together a patchwork of systems?

2. Are your systems just record keepers, or can they really help us make decisions?
Can we pull together information from any of our integrated systems? In exactly the form we want it?

3. Can you provide business software for both mainframe and microcomputers?
Do you develop this software yourself or do you simply market it for another company?

4. Are your systems truly online so all of our information is current?
How many of your systems are online? How secure are they?

5. Will my company have to be the one that discovers the bugs in your brand new system?
Just how long have your systems actually been used, and how have they been tested?

6. Will you update your systems as technology advances and regulations change?
What are some of your most recent updates? Will you keep us current on regulatory changes?

7. Do your systems really do everything you say they will?
Or will we have to change them or add to them to get the features we want?

8. How long have you been in business?
What are your revenues? What is your growth record? Where will your company be five years from now?

9. How many systems has your company installed?
How many of these were installed in the past six months? How many of your earlier customers are still using —and liking—your systems?

10. Do your financial systems handle unlimited foreign currencies?
Do your financial systems use a common set of currency exchange rates?

11. Can you link our executives' computers directly to the mainframe—so they can get their own information?
Is that software available right now?

12. How will you make sure our own people thoroughly understand your system?
Do you have educational centers near us, or will we have to travel all the way across the country to find one? Will you be there to help during installation and after?

13. How many of your people specialize in software for my industry?
How many accountants work for you? Human resource specialists? Manufacturing experts?

14. Do your systems have built-in features that make them easier to use?
What happens if someone needs help figuring out a feature? Do you have online documentation that's easy to understand?

15. As my business changes will your system be flexible enough to change with it?
Or will we have to pay a lot to revamp it? Or even regenerate it?

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